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Barge Canal Bulletin

DEPARTMENT OF

THE STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
ALEXANDER E. KASTL, Special Deputy State Engineer

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JANUARY, 1912

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Series V No. 1

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STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
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ISSUED MONTHLY UNDER THE AUTHORITY OF THE STATE ENGINEER, BY THE BUREAU OF PUBLICATION AND REPORTS, DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR

CONTENTS

Progress of Contract Work 2
Brief Account of Contract Work for December 3
Progress of Plans Being Prepared 26
Plans before Canal Board 28
Contract Advertised 28
Bids Opened 29
Annual Report of State Engineer and Surveyor (First Part) 30
Bids for Contract 104 38
Bids for Contract H 40

Progress of Contract Work.

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Jan. 1, 1912.
		Put under contract.*	Done to Jan. 1, 1912.	Done during Dec., 1911.	
1	Empire Engineering Corporation	$580,424	$474,400	0	81.8
2	Ferguson Contracting Company *a*	968,512	694,390	0	73.0
2E	Holler & Shepard *b*	(283,890)	242,130	$9,000	85.3
3	Sundstrom & Stratton	657,273	633,290	0	Finished.
4	Empire Engineering Corporation	726,780	720,073	0	Finished.
4B	E. J. Doyle & Co	1,351	1,310	0	Finished.
5	Empire Engineering Corporation *a*	156,941	125,820	0	80.2
6	F. A. Maselli	1,026,550	1,025,710	0	Finished.
7	Groton Bridge Company	101,930	98,929	0	Finished.
8	Pittsburg-Eastern Company *a*	1,516,789	920,420	0	60.7
9	Thomas Crimmins Contracting Co	803,297	655,461	0	Finished.
10	McDermott Contracting Co. *a*	1,111,965	668,360	0	60.1
10A	The T. A. Gillespie Company *b*	(106,738)	0	0	0.0
11	Fort Orange Construction Company	1,352,835	1,154,410	750	85.4
12	James Stewart & Company	3,555,467	2,366,560	27,300	66.6
13	Penn Bridge Company	28,126	20,180	0	71.7
14	Acme Engr'g & Contracting Co	2,985,225	2,439,000	8,110	81.7
14R	Thomas F. Riley	724	450	450	62.2
15	Atlantic, Gulf & Pacific Company	1,481,692	1,363,630	0	Finished.
16	United Construction Company	78,715	7,660	2,280	9.7
17	The Scofield Company *a*	842,418	57,560	0	6.9
17	Alexander Murdoch *b*	(812,286)	742,570	0	91.4
18	Kelley Bros. Contracting Company	611,382	476,979	0	Finished.
19	Great Lakes Construction Company	891,401	710,760	0	79.7
20A	Houston Barnard	490,592	178,010	5,760	36.3
20B	S. Pearson & Son, Inc	933,194	258,960	27,600	27.7
20C	American Pipe & Construction Co	585,720	394,130	29,310	67.3
20D	American Pipe & Construction Co	2,685,477	84,920	4,740	3.2
21	Lane Brothers Company	1,323,150	552,450	14,380	41.7
22	M. Fitzgerald	117,194	20,260	980	17.3
23	Millard & Lupton Company	1,808,797	817,580	51,910	45.3
24	James D. Sherrill	44,368	2,940	1,500	6.6
25	Atlantic, Gulf & Pacific Company	1,694,037	1,433,930	2,420	84.7
26	Lake Erie Dredging Company	40,057	35,443	0	Finished.
27	Kinser Construction Company *a*	723,269	378,650	0	Finished.
27A	Holler & Shepard *b*	(450,674)	99,300	6,140	22.0
29	Maryland Dredging & Contr'g Co	674,250	404,050	21,750	59.9
30	Acme Engr'g & Contracting Co	2,526,555	1,027,960	21,800	40.7
31	Casey & Murray	835,474	676,980	6,870	81.0
32	Penn Bridge Company	46,797	44,375	0	Finished.
33	Penn Bridge Company	199,640	164,550	0	82.5
34	M. Fitzgerald	22,449	22,258	0	Finished.
35	Gilmour-Horton-Allen Company	748,045	507,960	22,370	67.9
36	J. D. Miller	46,800	23,400	5,850	50.0
37	Henry P. Burgard	2,323,958	960,440	81,420	41.3
38	Henry Tosh & Son	16,870	16,287	0	Finished.
39	James Stewart & Company	1,048,674	146,240	6,500	14.0
40	United Engr'g & Contracting Co	2,299,902	1,377,520	77,220	59.9
41	Butler Bros. Construction Co	273,238	241,644	0	Finished.
42	Shanley-Morrissey, Inc	1,047,366	460,970	3,290	44.1
43	M. A. Talbott Company	1,365,876	143,070	14,800	10.5
44	Scott Brothers	1,758,068	696,310	11,690	39.6
45	Scott Brothers	472,802	418,652	0	Finished.
46	Kinser Construction Company	1,221,279	691,480	9,750	56.6
47	Crowell-Sherman-Stalter Company	1,279,328	778,650	24,700	60.9
48	Crowell-Sherman-Stalter Company	1,697,911	273,670	45,060	16.1
49	American Pipe & Construction Co	722,770	366,920	33,550	50.7
50	Buffalo Dredging Company	964,884	123,210	130	12.8
51	Alto Construction Company	389,842	84,260	6,330	21.6
53	Scott Brothers	167,585	164,576	0	Finished.
54	Hunkin-Conkey Construction Co	250,590	81,740	7,010	32.6
55	Arthur McMullen	945,840	854,070	15,930	90.3
55R	Joseph Kalk & Alfred S. Brown	7,561	5,630	0	74.4
60	Empire Engineering Corporation	1,491,317	1,214,460	8,430	81.4
61	Cleveland & Sons Company	1,088,890	639,770	32,430	58.8
62	I. M. Ludington's Sons, Inc	2,373,126	809,570	97,340	34.0
63	H. S. Kerbaugh, Inc	2,045,827	794,920	83,770	38.8
64	Empire Engineering Corporation	1,335,434	727,060	10,330	54.4
66	Empire Engineering Corporation	829,284	665,000	17,630	80.2
67	Larkin & Sangster	1,149,401	366,040	33,520	31.8
68	Shanley-Morrissey, Inc	1,042,736	945,490	10,660	90.7
69	I. A. Hodge & Company	240,061	180,860	8,070	75.0
70	Shanley-Morrissey, Inc	779,636	236,240	3,010	30.3

Progress of Contract Work—(*Continued*).

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Jan. 1, 1912.
		Put under contract.*	Done to Jan. 1, 1912.	Done during Dec., 1911.	
71	Shanley-Morrissey, Inc	$1,561,119	$790,530	$57,230	50.7
72	Shanley-Morrissey, Inc	1,202,658	618,900	29,320	51.4
73	E. M. Graves	771,627	518,990	0	67.2
75	Cornell Construction Company	42,917	0	0	0.0
76	The T. A. Gillespie Company	1,512,011	534,420	45,330	35.4
77	The T. A. Gillespie Company	1,669,765	672,740	63,580	40.3
78	Cunningham-Woodard Co	49,026	47,290	0	Finished.
79	Lupfer & Remick	37,480	33,710	2,190	90.0
80	Walter Bradley	117,391	87,860	28,630	74.8
82	Groton Bridge Company	28,841	18,460	5,770	63.9
85	Lupfer & Remick	13,238	1,390	0	14.6
86	Lathrop, Shea & Henwood Co	43,440	4,940	1,090	11.3
88	Lathrop, Shea & Henwood Co	25,658	0	0	0.0
90	D'Olier Engineering Co	180,318	145,750	8,350	80.8
91	The Hollington Co	42,940	6,610	2,600	15.4
	Totals	$72,954,147	$40,675,037	$1,157,930	.....

Cayuga and Seneca Canal.†

A	Scott Brothers	$357,627	$112,990	$10,020	31.6
B	Crowell-Sherman-Stalter Company	1,458,775	443,980	24,640	30.4
H	James H. Dawes	179,769	0	0	0.0
	Totals	$1,996,171	$556,970	$34,660	.....

* Includes all alterations in force to date. *a* Suspended by order of the Canal Board. *b* Relet to complete former contracts, contract price not included in total. † Authorized by separate appropriation.

Brief Account of Contract Work for December.

The following pages show what has been done during the month on the several contracts now in force on the Barge canal. The Erie canal contracts are described in order from Waterford west to Buffalo, and the Champlain and Oswego canal contracts follow, in order from south to north, while the Cayuga and Seneca canal contracts are given from east to west.

Erie Canal.

Contract No. 33.—Lock-gates and valves, guard-gates, etc., on Contracts Nos. 2, 10, 11 and 15.

Work on this contract remains in the condition noted in last month's issue, as substantially completed except at Lock No. 3 on Contract No. 10.

Contract No. 16.—For eleven steel highway bridges, ten of which are at various points on Contracts Nos. 25 and 27, Cham-

plain canal, and the remaining one on Contract No. 11, Erie canal.

At Dewey's bridge, unloading, hauling, erecting and riveting the structure progressed. The bridge is about half completed. Material for Brayton's bridge has been delivered during the month. Four other bridges are in process of fabrication.

Contract No. 36.—For constructing sixteen operating winches for movable dams in the Mohawk river.

Winches have been installed at Dams Nos. 7, 8, 10 and 11. Winches have been delivered on site at Dams Nos. 6 and 9.

Contract No. 13.—For three bridge superstructures on Contract No. 12 and two on Contract No. 18.

Work on this contract remains in the same condition as noted on December 1.

Contract No. 2-E.—For completing the construction of the canal from the Mohawk river at Waterford to a point about one-fourth mile above the head of Lock No. 3.

The steel sheeting used as forms for the concrete wall on the south side of the canal, extending from Lock No. 2 easterly beneath the Fourth St. bridge, was practically all driven. About 155 cu. yds. of concrete were deposited under water in this section of the wall.

Contract No. 11.—For prism excavation and construction from Contract No. 2 to Mohawk river below Crescent, including Locks Nos. 4, 5 and 6, highway, bridge abutments, guard-gate, masonry, etc.

About 45 cu. yds. of concrete were laid on the floor of Lock No. 5, 75 cu. yds. in the south retaining wall below Lock No. 6 and 30 cu. yds. in the north retaining wall at the Mohawk river. Work stopped on December 4.

Contract No. 14.—For work from Contract No. 11 to a point near Rexford Flats aqueduct, including Lock No. 7 and Dams Nos. 2 and 3; also for constructing Locks Nos. 13, 14 and 15, Dams Nos. 9, 10 and 11, Mindenville retaining dam, etc.

At Dam No. 2, Crescent, repairs to concrete stopped on December 4 and work on adjacent roads was also discontinued. Surveying and monumenting boundaries continued.

At Dam No. 3, Lock No. 7, Vischer's Ferry, plant was dismantled and shipped and pipe-lines, trestles, etc., removed. The scraper-tower excavated about 1,000 cu. yds. from prism and stopped work on December 12. The white oak fenders for the upper approach wall are completed. About 80 sq. yds. of second-class stone paving were laid in stream entrance and joints grouted. About 250 cu. yds. of wash wall were laid on south side of prism and 300 cu. yds. at the lower approach.

At the Stoney gate operating machinery was installed and bearings adjusted.

At Dam No. 9, Lock No. 13, Yosts, the dredge discontinued removal of coffer-dam and tied up behind pile protection at the lower guide wall. Riveting of tracks, cantilevers and stairs was completed, trusses for the north span painted, chains placed in boxes, etc.

At Dam No. 10, Lock No. 14, Canajoharie, the plant has been shipped away. All riprap and paving was completed, except behind the south lock wall. All contact strips were placed on the dam gates. The bridge is being floored. The bridge railing was erected and the painting practically completed.

At Dam No. 11, Lock No. 15, Fort Plain, filling behind the lower guide wall was stopped for the winter. Lock valves were set and work on lock gates is progressing.

Contract quantities: Excavation, 3,702 cu. yds.; sawed lumber, 19,938 ft. B. M.; wash wall, 91 cu. yds.; second-class paving, 153 cu. yds.; steel 31,769 lbs.; wrought-iron chains, 27,301 lbs.

Contract No. 14-R. — For the removal of bodies from cemeteries located within the flooded area of Contract No. 14 to new burial plots outside the flow lines.

At Crescent the removal of bodies from parcels Nos. 697 and 1325 has been completed. New plots were graded and head stones set.

At Vischer's Ferry the removal of bodies from parcel No. 2271 was completed.

Contract No. 20-D. — For dredging Mohawk river channel, constructing stream entrances, etc., between deep water below Rexford Flats aqueduct and center of bridge at Dam No. 9, at Yosts.

At Amsterdam, the dipper-dredge, part of the time in conjunction with the tower scraper, excavated about 9,279 cu. yds. of material, which was placed in spoil on the north side of the river.

Contract No. 8.—For constructing Dam No. 4 and Lock No. 8, at Scotia; Dam No. 5 and Lock No. 9, at Rotterdam; Dam No. 6 and Lock No. 10, at Cranesville, all on the Mohawk river.

At Dam No. 4, Lock No. 8, Scotia, borings were completed and plant is being stored.

At Dam No. 5, Lock No. 9, Rotterdam, some of the plant was dismantled and removed.

On the bridge, the north span was swung and uprights were completed in center and south spans. Gates were completed in south span and all but three gates completed in center span. About 14,000 ft. B. M. of deck planks were also placed.

At Dam No. 6, Lock No. 10, Cranesville, no work was done.

Contract No. 17.— For constructing Dam No. 7 and Lock No. 11, at Amsterdam, and Dam No. 8 and Lock No. 12, at Tribes Hill.

At Amsterdam the contractors placed two of their boats within the lock and closed the gates.

At Tribes Hill timber walks were placed on the needle-beams and lock gates.

Final estimates are being prepared.

Contract No. 20-C.— For dredging Mohawk river channel, constructing stream entrances, etc., between center of bridge at Dam No. 9, at Yosts, and center of bridge at Dam No. 10, at Canajoharie.

The hydraulic dredge continued prism excavation, placing about 45,472 cu. yds. of material in spoil on the south side of the river above the Canajoharie highway bridge. The dipper-dredge also excavated some 12,002 cu. yds., material being placed in channel below grade for lining prism. At the close of the month the dredges were moved into a slip southeast of the Canajoharie bridge for winter quarters. The work on the contract is practically two-thirds completed.

Contract No. 86.—For the construction of one span of a highway bridge over the Mohawk river at Canajoharie, to replace two existing spans, which will be removed.

The north pier was practically completed, forms, sheeting, etc., removed and river side partly backfilled. High water followed by cold weather caused temporary suspension of work. Quantities: Concrete, 72 cu. yds.; iron castings, 880 lbs.

Contract No. 20-B.— For dredging Mohawk river channel, constructing stream entrances, etc., between the center of bridge at Dam No. 10, at Canajoharie, and the upper miter wall of the new lock at Mindenville.

The combined excavating and disposal plant continued operating in prism until December 15, cutting to full width, after which the disposal-boat and one dipper-dredge continued the work, finer material being discharged by pump upon the Place spoil area and coarse material deposited along the south bank. The total output was about 31,760 cu. yds. During the remainder of the month one dipper-dredge cast over from the north side of the prism into spoil about 11,500 cu.yds. All the dredges stopped work on December 29 and began moving to Lock No. 16 for winter quarters. Total excavation, 43,260 cu. yds.

Contract No. 20-A.— For dredging Mohawk river channel, etc., between Castle creek and upper miter wall of lock at Little Falls.

The hydraulic dredge continued excavating from prism in river until December 4, when it was placed in winter harbor on the Garlock property. The steam-shovel began operating in the land line on December 22, working to grade and mostly in rock. Drills were operated ahead of the shovel. The orange-peel bucket machine worked a few days in prism, but deposited material along east bank of creek inside of lines. A large force was employed in getting the shovel plant organized on the land line. Locomotives and cars were transported from Little Falls and about 2,000 feet of construction track laid. Pumps and boilers were installed to drain the prism. Total excavation, 7,202 cu. yds.

Contract No. 31.— For improving the Erie canal at Little Falls, constructing Lock No. 17, and modifying the dam and constructing guard-gates at Rocky Rift.

At Lock No. 17, the east coffer-dam and part of the west coffer-dam and tow-path were removed, to open into the old canal. Material was deposited in rear of the north upper guide wall. Further west, excavation was continued. Additional rock was stripped, material heaped within lines and some rock excavated for crushing. Cleaning of canal bottom continued. Other excavation was at retaining wall No. 4, at Hansen Ave. bridge and at guard-gate.

Concrete was placed in counterweights at guard-gate and in retaining wall No. 4. Work at the dry retaining wall was discontinued after adding some 50 cu. yds. to the structure. About

51 cu. yds of riprap were placed in rear of north lock wall. A snubbing-post and steel dowels were placed at wall No. 4. At retaining wall No. 2, boiler and mixer were placed for concreting. The city built a temporary water-pipe line over wall No. 1, under roadways to the Adirondack mill.

Quantities: Excavation, 3,313 cu. yds.; concrete, 427 cu. yds.

Contract No. 30.— For dredging channel in Mohawk river and land line from Little Falls to Sterling creek, constructing Lock No. 18 at Jacksonburg, Dam No. 14 and guard-gates at Herkimer, retaining dam at Frankfort, bridges, etc.

The Thew shovel and a guy derrick continued excavation at the east end of the contract, spoiling 3,944 cu. yds. of rock output on the Casler property. The dipper-dredge *Herkimer* continued excavating outside of prism lines, placing its material on railroad property. It has now stopped work and is undergoing alterations.

At Lock No. 18, work progressed except when interrupted by high water in the lock pit. Excavation progressed between the lock walls and for the slope wall on the east end of the north wall. The upper lock gates were assembled and are ready for riveting. Assembling the lower gates began. West of Jacksonburg, the south embankment progressed on borrowed material, but was not brought to finished lines by the derrick. Farther west a derrick with clam-shell bucket is trimming the north embankment to completed lines. Tower No. 1 shaped the south embankment and excavated for wash wall with scrapper bucket. Another traveling derrick is completing prism excavation, placing material in north embankment.

At Herkimer, tower No. 5 excavated prism, placing material in north embankment and in spoil behind. The material is too wet to retain lines. At the mouth of West Canada creek about 347 cu. yds. of dry wall were built on the foundation placed last season. At Herkimer the wash wall on the north bank was completed. Tower No. 2 built hydraulic dikes on the Lamberson property near McGowan. The hydraulic dredge *Clinton* operated in prism, but owing to hard material encountered, removed only 22,200 cu. yds. At the river cut-off near the west end of the contract, sloping the banks was practically completed and a timber crib was partially placed across the old river channel.

Quantities: Excavation, 40,216 cu. yds.; embankment, 12,628 cu. yds.; grubbing, 456 cu. yds.; wash walls, 1,012 cu. yds.; metal in gates, 53,253 lbs.

Contract No. 29.— For excavating prism from Sterling creek to Oneida-Herkimer county line, constructing lock at Sterling creek, bridges, etc.

The month's record of excavation was 4,011 cu. yds. from prism and 785 cu. yds. from lock pit. About 100 cu. yds. of embankment were formed south of the upper thrust wall of the lock. Some 8,848 ft. B. M. of sheet-piling, including waling bolted on, were used on north side of Morrison swamp. About 2,334 cu. yds. of concrete were laid in Lock No. 19, of which 736 cu. yds. were in walls and the remainder in floor and breast wall.

Some 1,184 lbs. of steel were used, mostly for bolts, etc., in piling, and 3,996 lbs. of reinforcing metal were placed in the lock. The construction of gates and buffer-beams progressed, 75,720 lbs. of metal being used on the lower gates and 2,314 lbs. on lower buffer-beam.

Contract No. 42.— For prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillways, stream entrances, culverts, etc.

The total excavation was 17,332 cu. yds., of which 14,583 cu. yds. were taken from south side of the new river channel, 1,154 cu. yds. from approaches and 1,595 cu. yds. from approach walls to Lock No. 20.

At Park Ave. bridge, additional lumber was received and seven trestle bents set up. The steel for superstructure has not arrived.

Lidgerwood excavator No. 2 finished driving piles and making trestles for river crossing, and moving south on December 7, caught fire and was badly burned. The damaged machinery was replaced from excavator No. 1. On December 19, the machine resumed excavating, working west on the south side of the river.

Repairs were made to supply track near Whitesboro-Marcy road bridge. A Blake pump on the south side supplied water to a storage tank. A trestle was erected across the river opening in south bank, but high water washed out the east end of the trestle. A commissary barn containing some of the lock structural steel burned down on December 1. A boiler and 10-in. pump were set up just south of the dredge, for emergency pumping. The dredge operated three shifts daily in prism. Thew shovel No. 1 excavated from prism and south wall, material being transported in dump trains and spoiled on south bank. Track changes were made and a trestle and coal supply track to dredge were partially completed. Concrete materials were unloaded at lock and repairs were made to dump cars and sleighs. High water delayed the work.

Contract No. 43.— For constructing the canal from a point just south of Oriskany road to about 1,500 feet west of Mud creek.

The dredge *Stanwix* removed 35,624 cu. yds. of material from the prism. Some 279 cu. yds. of concrete were placed at Oriskany road bridge over canal. About 90,796 lbs. of structural steel were placed at Mill St. bridge and 52,280 lbs. over the river channel and 12,083 lbs. over the canal, at Oriskany road bridge. The Mill St. bridge is nearly completed.

Contract No. 44.— For constructing the canal from about 1,500 feet west of Mud creek, west of Rome, to about three miles west of New London, including junction lock, Locks Nos. 21 and 22, bridges, culverts, spillways, stream entrances, etc.

About 38,463 cu. yds. were excavated, distributed as follows: In the prism, Marion shovel No. 1347 removed 2,037 cu. yds., Marion shovel No. 883, 5,878 cu. yds.; Bucyrus shovel No. 841, 10,936 cu. yds. and tower No. 2, 14,901 cu. yds. At Lock No. 21 a derrick and clam-shell bucket removed 219 cu. yds. and at Lock No. 22 tower No. 1 removed 4,492 cu. yds. Some 2,878 sq. ft. of steel piling were driven at lower south approach wall of Lock No. 21, about 264 lin. ft. of foundation piles were driven at the bridge and 288 cu. yds. of concrete were laid, 236 cu. yds. being placed in the north wall and the remainder in the bridge.

About 40 sq. yds. of second-class stone paving were placed in south ditch.

Contract No. 4-B.— For constructing a concrete highway bridge along Burdick's road, adjacent to Contract No. 4.

Final estimates being prepared.

Contract No. 12.—For excavating prism between Oneida lake and Mosquito Point bridge on Seneca river; constructing Lock No. 23 and other structures.

At Lock No. 23 concrete work stopped on December 3. A few men were retained to set up derrick and drive sheeting around east approach walls. Pumps were installed to keep the lock pit dry. Dredge No. 7, working in hard material below the D. L. & W. R. R. bridge, dredges Nos. 4 and 5, cleaning up the prism cut at Hickory island west of Weedsport bridge and hydraulic dredge No. 1, working in hard material in the vicinity of Free bridge, all closed down on December 22. No. 7 was sent to Baldwinsville for repairs and the others will follow.

Quantities: Excavation, 46,161 cu. yds.; concrete, 311 cu. yds.

Contract No. 22.— Bridges on Contract No. 12.

At Free bridge 29 foundation piles, aggregating 592 lin. ft., were driven for south abutment.

At Bonta's bridge steel sheet-piling for coffer-dam at pier No. 1 was driven.

At Weedsport bridge the crib work under the fourth panel point has been carried up to the lower chord of the bridge and cribs are being placed under the third panel point and the south concrete approach slab.

Condition of steel at shops remains as on December 1.

Contract No. 46.— For the construction of the canal from Fox Ridge to the southeast corner of the town of Galen, including Lock No. 25, a movable dam at May's Point, bridges, etc.

About 56,964 cu. yds. were excavated. Hydraulic dredge completed about 500 lin. ft. of prism north of the West Shore R. R. Diking continued north and south of the Toll road bridge.

Contract No. 47.— For the construction of the canal from the southeast corner of the town of Galen to a point near the N. Y. C. & H. R. railway crossing at Lyons, including Lock No. 26, a dam across the Clyde river, highway bridge, stream entrance, etc.

About 2,546 cu. yds. of concrete were placed in Lock No. 26 during the month, practically completing it. Erection of gates was commenced. About 10,005 lbs. of steel were placed.

Contract No. 48.— For the construction of the canal from a point near the N. Y. C. & H. R. railroad crossing at Lyons to a point near the West Shore railroad crossing at East Newark, including Locks Nos. 27 and 28-A, dam and power-house, retention dam across Canandaigua outlet, spillway, culverts, highway, bridge, approaches, etc.

The dredge *Lyons,* working on triple shifts for 23 days east of Lock No. 27, removed 46,683 cu. yds. At the blue cut, about two miles west of Lyons, the Marion shovel removed about 3,583 cu. yds. and was taken from the contract on December 15. West of this, the Browning crane excavated 14,332 cu. yds. About 1,970 cu. yds. were excavated by hand at various places.

At Geneva St., the steel sheet-piling is driven and 5,254 lin. ft. of piles driven for wall and bridge abutments completes the item. About 7,702 cu. yds. of embankment were formed at the blue cut by the Browning crane and steam-shovel. About 844 cu. yds. of

second-class concrete were placed, of which 66 cu. yds. were in spillway, 431 in Lock No. 28-A and the balance in its upper approach, which is nearly completed. About 20 cu. yds. of reinforced concrete were placed at blue cut dive-culvert, completing its concrete.

Contract No. 76.— For the construction of the canal from a point near the West Shore railway crossing at East Newark to a point about one-half mile east of Port Gibson.

Lock No. 28-B is practically complete and work has closed down for the winter. About 188 cu. yds. of concrete were laid here. In the abutments of the bridge below the lock 355 cu. yds. of concrete were placed.

At Newark dock, 7,258 cu. yds. were removed, completing excavation for this structure.

Steam-shovel No. 20 removed 15,652 cu. yds. of material from the prism between Allerton's and Peek's bridges. Shovel No. 21 removed 45,060 cu. yds. of material and about 17,763 cu. yds. of embankment were built at the west end of the contract.

Contract No. 77.— For constructing the canal from one-half mile east of Port Gibson to one-half mile west of Palmyra, including Lock No. 29, power-plant, bridges, culverts, etc.

At Lock No. 29 some concreting was done but the work closed down on December 16. About 53 cu. yds. of concrete were placed in the lock proper and 582 cu. yds. in the lower approach. The suction dredge working east took out about 60,000 cu. yds. of material. At Harrison's spillway work was rushed in double shifts. About 2,160 cu. yds. were excavated, 492 cu. yds. of concrete laid and both round and sheet piles driven.

At the big cut shovel No. 22 removed 38,000 cu. yds. of material. The erection of the superstructure of Maple Ave. bridge has commenced. About 135,000 ft. B. M. of wooden sheet-piling were driven under the embankment at the east end of the contract. Quantities: Excavation, 101,692 cu. yds.; concrete, 1,126 cu. yds.; sawed lumber, 142,140 ft. B. M.; iron and steel, 129,500 lbs.; round piles, 387 lin. ft.

Contract No. 49.— For prism construction from a point about 500 ft. east of Yellow Mills bridge, about one mile west of Palmyra, to the Monroe county line, including Lock No. 30, sluice-gates, highway bridges, culverts, etc.

In the prism at the west end of the contract the dredge *Fairport* excavated 59,993 cu. yds. and closed down for the winter. The Lidgerwood excavator removed 24,322 cu. yds. from prism. At Wayneport bridge 258 cu. yds. of second-class concrete were placed. The superstructure for Frear's bridge was erected and riveting started. About 3,283 cu. yds. of wash wall were built between Palmyra and Macedon.

Contract No. 63.— For enlarging present canal and constructing culverts, sluiceways, waste-weir, guard-gates, dock walls, bridges, highway changes, etc., between Wayne-Monroe county line and Kings Bend.

The Lidgerwood excavator continued operating in north side of prism, casting material either into north embankment or spoil. The Fogarty machine worked most of the month on the new channel for Thomas creek. Three steam-shovels — four after December 21 — excavated in prism at east end of Irondequoit trough at wide waters near Cartersville, in vicinity of State St. bridge and just west of the West Shore railway bridge, sending a small part of the material to the Cartersville embankment for puddle and the remainder to spoil banks. Excavation by hand or by teams and scrapers was done at culverts Nos. 28, 33 and 34, Bushnell's Basin guard-gate, Knapp's, Monroe Ave., Cartersville, and Mitchell's bridges, and wings of Main St., Pittsford, bridge, and for wash walls and walls of Irondequoit trough.

Concreting was done at culvert No. 4, now complete, Monroe Ave., Main St., Pittsford, Knapp's and Mitchell's bridges, Irondequoit trough walls and in setting snubbing posts at Pittsford dock wall. Considerable wash wall was built at various places and paving in inlet ditch of culvert No. 26. False work at Main St., Pittsford, and at Bushnell's Basin was erected and assembling of steel for bridges begun. Steel for three other bridges has been delivered.

Quantities: Excavation, 143,031 cu. yds.; embankment, 15,577 cu. yds.; concrete, 1,007 cu. yds.; dry stone work, 1,705 cu. yds.; sawed lumber, 6,486 ft. B. M.; iron and steel, 178,831 lbs.

Contract No. 23.— For prism excavation between Kings Bend and Genesee river, and construction of Locks Nos. 32 and 33, guard-lock, bridges, culverts, etc.

Drainage pumps worked continuously at Lock No. 33 and part of the time at East Henrietta and West Falls roads. Steam-

shovel No. 938 continued operating in prism between the locks, material being placed either in approachs to Kingsley road bridge, spoil bank on south side or as backfilling for walls at Lock No. 32. Steam-shovels Nos. 1178 and 2449 continued excavating in prism between East Henrietta and West Falls roads, sending material to spoil banks on north side west of South Ave. and for about 2,000 feet west of Clinton Ave. Excavating by hand and by teams and scrapers was done at Kingsley road, lower guide wall of Lock No. 33, culvert, spillway, and back-posts of bridge at Edgewood Ave. and south abutment of road bridge and culvert at West Henrietta road, etc.

About 3,690 cu. yds. of concrete were distributed as follows: In Lock No. 33 and lower guide wall, 3,375 cu. yds.; in culverts, 105 cu. yds.; in bridge abutments, 210 cu. yds. About 10,241 lbs. of reinforcing metal were used.

Kingsley road bridge is completed. At Edgewood and South Ave. bridges, riveting and painting is done. The south truss of Clinton Ave. bridge is erected. Flooring is being placed on Edgewood Ave. bridge and wooden fence is being built on Kingsley road bridge approaches. Work was hampered considerably by wet clay in cut.

Quantities: Excavation, 71,189 cu. yds.; iron and steel, 165,254 lbs.

Contract No. 21.— For prism excavation and construction of bridge abutments, guard-lock, etc., from the Genesee river west 2.56 miles to a point just west of the N. Y. C. & H. R. railroad crossing.

Electric pumps were operated the entire month, draining the prism cut at Scottsville road and Brooks Ave. crossings. Steam-shovels Nos. 2, 3 and 4 continued excavation in the prism, taking out about 27,966 cu. yds. of earth and rock which were disposed of on spoil banks. Shovel No. 2 closed down for the winter on December 12.

From 3 to 5 channeling machines were cutting to prism lines on the north side, surfacing 3,895 sq. ft. From 10 to 13 steam-drills were in operation ahead of the shovels.

Contract No. 82.— For furnishing and erecting three steel highway bridge superstructures on Contract No. 21, near Rochester.

During the month the steel of the Scottsville road bridge was received, false work erected and assembling of trusses and floor system begun. About 118,840 lbs. of steel were placed.

Contract No. 6.— For prism excavation and construction of five bridge foundations between a point just south of Buffalo road and another point near South Greece and southwest of Rochester.

Final estimates being prepared.

Contract No. 75.— For construction of three guard-gate superstructures on Contracts Nos. 60, 61 and 64.

The fabrication of steel work has begun at the shops.

Contract No. 60.— For prism excavation and construction of culverts, bridge structures, etc., between a point 1.75 miles east of South Greece and a point 0.5 mile west of Adams Basin.

Prism excavation continued by hand and Koppel cars and also with teams and scrapers. Much of the hand labor was in trimming cuts and embankments to proper slopes and for wash walls and puddle. Material was placed partly in embankment and partly in the north approach of bridge No. 95. Total excavation was 9,133 cu. yds. Third-class riprap was placed at the abutments of bridges Nos. 96 and 100. Wash wall to the extent of 569 cu. yds. was placed at various points; also 67 cu. yds. of puddle. Lining to the amount of 161 cu. yds. was placed on the tow-path in scattered sections. A traveling crane is being erected.

Contract No. 61.— For prism excavation and construction of culverts, bridges, waste-weir, etc., between a point 0.5 mile west of Adams Basin and Monroe-Orleans county line.

Excavator No. 1 worked the entire month taking out the old berme bank, casting material in prism, then rehandling it and casting it into the new embankment on the north side. Excavator No. 2 removed material from the bottom of the prism, placing it in north embankment. Excavator No. 3 removed material from the old berme bank, casting part of it into the north embankment and spoiling the remainder. The derrick scow, lying on the canal bottom, removed the old vertical wall until December 15, when it was placed out of commission. Excavation by hand and by teams and scrapers was carried on at culverts Nos. 57, 58 and 59, bridge No. 110, for wash wall and in prism at various places. Concreting was done at culvert No. 57 and at vertical wall, Brockport. False work for bridge No. 109 was erected, steel work assembled and riveting is well under way. Quantities: Excava-

tion, 30,792 cu. yds.; embankment, 16,584 cu. yds.; concrete, 598 cu. yds.; iron and steel, 97,442 lbs.

Contract No. 62.— For prism excavation and construction of culverts, bridge substructures, etc., between Orleans-Monroe county line and a point near Eagle Harbor bridge.

Albion section:

About 55,400 cu. yds. of material were excavated. This included work by steam-shovel and clam-shell east of Hindsburg bridge; by team outfits west of culvert No. 71, west of Hindsburg bridge, east and west of culvert No. 78 and east of Lattin's bridge; by an orange-peel outfit west of Transit bridge and east of culvert No. 73; by the Lidgerwood excavator east of the turning basin at Eagle Harbor; at culverts Nos. 71, 73, 75, 78, 79 and 83; at north abutment of Hindsburg bridge and south abutments of Bidwell's, Transit and Brown St. bridges; at Albion north vertical wall and at Eagle Harbor trough.

About 24,900 cu. yds. of embankment were formed. This included work by team outfits west of culvert No. 71, east and west of culvert No. 78 and east of Lattin's bridge; by clam-shell outfit east of Hindsburg bridge; by orange-peel outfit west of Transit bridge and by Lidgerwood excavator.

About 1,469 cu. yds. of concrete were laid, at culverts Nos. 71 and 77, south abutments of Transit and Brailey's bridges, vertical walls at Albion and Eagle Harbor waste-weir. About 199 cu. yds. of wash wall were built east of culvert No. 85.

Holley section:

About 37,500 cu. yds. of material were excavated. This included work at culverts Nos. 63 and 70, north abutment of County Line bridge, waste-weir, Holley trough wall and south wings at McCarthy's guard-gate; in prism with shovel and crane and with shovels Nos. 2, 3 and 4.

About 11,600 cu. yds. of embankment were formed, both on tow-path and berme sides. About 917 cu. yds. of concrete were laid, at south wing of McCarthy's guard-gate, footings at Holley trough wall and north abutment of County Line bridge. Some 58 cu. yds. of third-class concrete were also laid at the guard-gate. About 1,500 cu. yds. of rubble masonry and 200 cu. yds. of wash wall were built at various points.

At McGuire's bridge 29,000 lbs. of structural steel were used and 300 sq. yds. of wooden pavement laid. About 7,000 lbs. of

metal reinforcement were used in the footings of Holley trough wall.

Contract No. 64.— For improvement from 600 ft. west of Prospect St., Medina, to 100 ft. east of Gasport bridge.

The total amount excavated was 9,000 cu. yds., including work at guard-gate, Watson's waste-weir, trimming berme slopes and earth and rock in prism. About 1,200 cu. yds. of embankment were formed and 521 cu. yds. of wash wall built. Some 385 cu. yds. of concrete were placed at north abutment of guard-gate and 65 cu. yds. of riprap at Reynale's Basin bridge.

Contract No. 66.— For prism excavation and constructing bridges and approaches, culverts, etc., from 100 ft. east of Gasport bridge to 600 ft. east of Lockport locks.

The total excavation for the month was 16,806 cu. yds. The Browning crane, equipped with scale buckets, excavated 3,520 cu. yds., mostly rock, at Gasport. About 4,362 cu. yds. were excavated in the same manner by the Wellman-Seaver crane, operating on berme bank near culvert No. 118, of which 260 cu. yds. were placed in first-class embankment. East of Millard's bridge the derrick boat No. 27, resting on bottom, in conjunction with Koppel car outfit, excavated 1,015 cu. yds. At various places between culverts Nos. 118 and 120, 1,901 cu. yds. were excavated from puddle notch and 2,073 cu. yds. of puddle bank protection placed. Near culvert No. 120 on berme side, 1,717 cu. yds. were removed from prism by slip scrapers and 634 cu. yds. were placed in embankment. About 58 cu. yds. of silt were removed from the floor of culvert No. 120 and the work of tearing out the old timber invert commenced. About 601 cu. yds. were removed by trimming slopes between Wakeman's bridge and culvert No. 121, throwing material below grade. Some 3,517 cu. yds. of rock and earth were removed from the prism between Chapel St. and the west end of the contract by the Marion steam-shovel and Browning crane. About 352 cu. yds. of concrete were placed in facing and splay walls at Gasport and 61 cu. yds. in the reinforcing wall between Chapel and Exchange Sts., Lockport. About 113 cu. yds. of riprap were placed at Orangeport and Lake Ave. bridges. About 132 cu. yds. of wash wall were built at various places and 840 lbs. of dowels were placed in 205 lin. ft. of holes drilled in Gasport facing wall and Lockport reinforcing wall.

Contract No. 67.— For construction of Locks Nos. 34 and 35 and approaches, etc., at Lockport.

The Thew shovel, working at the south side of the prism near the east end of the contract, removed 100 cu. yds. The Bucyrus shovel and three trains, on triple shifts, removed 14,269 cu. yds. from Lock No. 34. Hand labor, derricks and one train removed 390 cu. yds. west of Lock No. 35. One channeler cut 1,418 sq. ft. in Lock No. 34. Two other channelers cut 2,243 sq. ft. on the south side of the prism along Buffalo St. About 93 cu. yds. of concrete were placed in the upper breast wall of Lock No. 35. Along Buffalo St. retaining wall 203 lin. ft. of pipe railing were erected. At the Main St. bridge 223,953 lbs. of structural steel were placed in position.

Contract No. 40.— For constructing the canal, culvert entrances, guard-gates, stream entrances, bridges, etc., from the Lockport locks to Sulphur Springs guard-lock.

The total excavation for the month was 84,908 cu. yds., of which 1,957 cu. yds. were excavated by shovel and trains near the harbor section, 29,788 cu. yds. by double-boom crane and steam-shovel west of Hitchin's bridge, 18,732 cu. yds. by steam-shovel and cableway near Hinman road, 16,131 cu. yds. by cantilever west of Riley's bridge, 11,864 cu. yds. by Browning excavator and tipple just east of new guard-gate, 6,367 cu. yds. by steam-shovel and trains near old guard-lock and the remainder by hand at the new guard-gate.

Eight machines cut 10,953 sq. ft. of channeling, of which 2,547 sq. ft. were near Prospect St. bridge, 8,238 sq. ft. east of Hitchin's bridge and 168 sq. ft. near Hinman road. Some 560 cu. yds. of concrete were placed, of which 306 cu. yds. went into the wall on the tow-path side of Hinman road, 118 cu. yds. in the new guard-gate, 90 cu. yds. in the new wall on tow-path side near guard-lock and the remainder into two new culverts and north side of Summit St. bridge.

About 2,233 cu. yds. of fourth-class riprap protection were placed below the wash wall near guard-gate. By alteration No. 3, which has been added to the contract, riprap protection is to be placed below the wash wall.

Contract No. 19.— For prism excavation, rebuilding bridges, constructing masonry culvert, concrete-capped pile docking, etc., between Sulphur Springs guard-lock and mouth of Ellicott creek.

The dipper-dredge *Buffalo* excavated on double shifts about 4,000 cu. yds. at Tonawanda, which were deposited in Three-Mile bend and will be rehandled by the *Niagara*. The *Buffalo* stopped work on December 9. The *Lehigh* was employed at Tonawanda on single shift, excavating for a dry dock. The pile-driver was employed at Martinsville about one week. Sheeting was driven, dead men placed, etc.

The coffer-dam for dry excavation between the guard-lock and McDonald's culvert was completed, unwatered and about 500 cu. yds. of silt were stripped from rock and removed by cableway in skips to spoil.

Champlain Canal.

Contract No. 70.— For dredging a channel in the Hudson river from outlet of Barge canal at Waterford to Lock No. 1.

Tower No. 2 continued operating in gravel during the first half of the month. Tower No. 3 is about ready to begin excavation. In the shovel-cut drilling and blasting were completed and pumping continued throughout the month. The steam-shovel operated on the east side of the prism until the middle of the month and was then taken out and stored. Quantities: Excavation, 3,044 cu. yds.

Contract No. 71.— For constructing Lock No. 1 and Dam No. 1, above Waterford, and dredging Hudson river from Lock No. 1 to lower Mechanicville lock.

At McBride's the shovel has been removed from the cut and stored, but no contract work was done.

At Smith's, steam-shovel work continued on double shifts throughout the month, most of the work being at the up-stream end of the cut.

At site of Lock No. 1, both buffer-beams were delivered and the upper beam is being moved into place. Steady progress was made in placing concrete. The lock site was flooded on the morning of December 24 by the breaking of a coffer-dam on Contract No. 70.

Quantities: Excavation, 22,511 cu. yds.; concrete, 1,867 cu. yds.; iron and steel, 5,603 lbs.

Contract No. 69.— For constructing Lock No. 2, at lower Mechanicville.

The west pier of the bridge was built. Work on the tail-race span continued. Needle-beams were delivered and the lower one

was hung. High water in river flooded the lock about the middle of the month. The bridge below the lock is being erected.

Quantities: Excavation, 402 cu. yds.; concrete, 81 cu. yds.; iron and steel, 77,199 lbs.

Contract No. 72.— For dredging Hudson river from lower Mechanicville to Stillwater.

The dipper-dredge continued excavating at Hart's until December 23, when about 20 feet of coffer-dam at the north end broke, flooding the entire cut. Repairs were in progress during the last part of the month. Spoil is being conveyed to the bank on the west shore of the river.

The hydraulic dredge below Stillwater stopped working early in the month and was moved to the upper pool above Lock No. 3, to winter quarters.

At Stillwater, a coffer-dam is being built around the submerged steam-shovel, in order to remove it from the cut.

Quantities: Excavation, 23,648 cu. yds.

Contract No. 68.— For constructing Lock No. 3, at Mechanicville; making prism excavation and constructing Lock No. 4, at Stillwater; prism excavation and Lock No. 5, at Northumberland.

At Lock No. 3, upper Mechanicville, the upper gates are practically erected. Some grading, cleaning up and getting plant in shape for winter has been done.

At Lock No. 5, Northumberland, cleaning up and shipping away plant was in progress during the first half of the month. Since then work has ceased.

Quantities: Excavation, 3,941 cu. yds.; embankment, 3,050 cu. yds.

Contract No. 73.— For dredging Hudson river from Stillwater to Northumberland.

No work is in progress. The dredges are laid up for the winter below Lock No. 5 at Schuylerville.

Steel has been delivered for a new bridge for the G. & J. R. R. across the canal at Northumberland.

Contract No. 88.— For the construction of a steel highway bridge at Schuylerville, within the limits of Contract No. 73.

Work not yet begun.

Contract No. 1.— For dredging Hudson river from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; constructing Crocker's Reef dam and approaches to "Land Line," etc.

Work on this contract is closed down indefinitely.

Contract No. 24.— For constructing guard-gate at Crocker's Reef.

The west slope below the guard-gate was excavated for wash wall and progress was made in the removal of rock from the bottom of the prism. A switch is to be placed opposite Crocker's bridge for handling material for wash wall.

Quantities: Excavation, 1,543 cu. yds.; embankment, 431 cu. yds.

Contract No. 54.— For constructing Lock No. 7, at Fort Edward.

About 5,000 cu. yds. of material were excavated under the west lock wall, most of which was temporarily deposited against the back of the coffer-dam, to be later placed as backfill for east lock wall. About 1,000 cu. yds. were spoiled. As rapidly as excavation was completed, foundation and triple-lap sheet-piling were driven. Some 5,300 lin. ft. of round piles and 30,000 ft. B. M. of wooden sheeting were used. On December 13, heavy rains flooded the pit and this was not again unwatered until the month closed. Concrete work completed includes the upper gate chambers and one 30-ft. section of core wall. Some 586 cu. yds. were laid.

Contract No. 27-A.— For completing the construction of the canal between the Hudson river at Fort Edward and the south end of Contract No. 25, at Dunhams Basin road.

The steam-shovels operated at the south end of Lock No. 8 and in prism north of Argyle street. Teams removed material for the wash wall notch south of East street. The southeast splay wall at Lock No. 8 was backfilled and a small amount of embankment was placed in the west approach to Argyle street. The east abutment of Argyle street bridge was completed. The East street bridge abutments are ready for the superstructure.

Quantities: Excavation, 7,562 cu. yds.; embankment, 942 cu. yds.; concrete, 33 cu. yds.; dry stone work, 965 cu. yds.; sawed lumber, 2,205 ft. B. M.; iron and steel, 3,749 lbs.

Contract No. 25.— For prism excavation between a point 0.6 mile north of Comstock post-office and highway crossing at Dunhams Basin; constructing Lock No. 9, spillways, power-plant, etc.

About 1,218 cu. yds. of borrow material were excavated and 1,413 cu. yds. of embankment were placed at Comstock and Fort Ann bridges. Some 770 cu. yds. of wash wall were placed from the north end of the contract to Brayton's bridge, completing the wall. About 138 cu. yds. of riprap were placed near Smith's Basin and Brayton's bridges. Some 340 cu. yds. of cinder filling were placed for Comstock bridge. The dredge *Champlain* at Lock No. 9 and the dipper-dredge at Fort Ann were under repair.

Contract No. 15.— For prism excavation and constructing Lock No. 11, Dam No. 4; Lock No. 12, Dam No. 5; spillway, culverts, highway, bridges and other structures between a point 0.6 mile north of Comstock post-office and Lake Champlain at Whitehall.

Contract finished. Final estimates being prepared.

Oswego Canal.

Contract No. 39.— For dredging channel in Oswego river, constructing stream entrances, excavating through Hinmansville cut-off, etc., between Three River Point and Fulton, except portion covered by Contract No. 53.

The total excavation on this contract for the month was 7,838 cu. yds.

Contract No. 85.— For constructing a steel bridge over the lock at Phoenix.

No contract work was done during the month.

Contract No. 80.— For constructing a concrete dam across the Oswego river at Phoenix.

About 747 cu. yds. were excavated and 1,414 cu. yds. of concrete were laid, of which 760 cu. yds. were placed in the north head-gates and the remainder in the north dam. Some 9,337 lbs. of reinforcing metal were used in the head-gates and 330 lbs. in the dam. About 59,190 lbs. of structural steel were also used in the head-gates and 4,919 lbs. in the dam. In valves, 694 lbs. were placed in north head-gates, 698 lbs. in north dam and 270 lbs. in south head-gates. In the Taintor gates at the movable dam 144,195 lbs. of metal were placed.

Contract No. 10-A.— For completing the construction of the canal, raising the upper dam, etc., from Broadway bridge, Fulton, south to Contract No. 39.

Contract recently awarded.

Contract No. 78.— For constructing a dike on Oswego river, near Fulton.

Contract finished. Final estimates being prepared.

Contract No. 79.— For the construction of two spans of a highway bridge over the river at Bridge street, in connection with six other similar spans to be constructed by the city of Oswego.

Further progress was made on the superstructure, using 42,689 lbs. of structural steel and 30 sq. yds. of wood block pavement.

Contract No. 37.— For dredging a channel in Oswego river, constructing Locks Nos. 5 and 6, dams, bulkheads and other structures, and the removal of Battle Island and High dams, between Contract No. 10, at Fulton, and Contract No. 35, at Oswego.

About 46,667 cu. yds. were excavated, of which 38,141 cu. yds. were removed between Contract No. 10 and Lock No. 5, 2,170 cu. yds. from bulkhead No. 6, 6,126 cu. yds. from Lock No. 6 to Contract No. 35 and the remainder from test pits. Some 584 cu. yds. of embankment were formed at bulkhead No. 6.

Contract No. 35.— For prism excavation and constructing Locks Nos. 7 and 8, bulkheads, culverts, spillways, etc., between a point one-half mile above Utica street bridge and harbor line north of Bridge street, at Oswego.

About 2,991 cu. yds. were excavated, of which 521 cu. yds. were taken from the east wall, 225 cu. yds. from Lock No. 7, 910 cu. yds. from its east lower approach, 256 cu. yds. from the east upper approach to Lock No. 8 and 1,079 cu. yds. from the prism between. About 2,152 cu. yds. of concrete were laid, of which 731 cu. yds. were in the east wall, 533 cu. yds. in Lock No. 7, 44 cu. yds. in retaining wall west of this lock, 108 cu. yds. in its east lower approach and 736 cu. yds. in the east upper approach of Lock No. 8.

At Lock No. 7, there were used 32,946 lbs. of metal in needle-dams, 4,350 lbs. of structural steel in lock and 19,500 lbs. in bridge over lock, 86 lbs. of metal reinforcement and 387 lbs. of

plain castings. In the east upper approach of Lock No. 8, 122 lbs. of metal reinforcement and 775 lbs. of plain castings were used. Some 76 fender fastenings were placed in the east wall and east upper approach to Lock No. 8.

Cayuga and Seneca Canal.

Contract A.— For constructing Lock No. 1 and Dam No. 1, near Cayuga.

Excavating with two travelers equipped with clam-shell buckets continued in center and east wall of lock. Material from one of the excavators was placed in cars and conveyed to spoil north of the lock. The other machine dumped its material directly into spoil west of the lock. Concreting in the lock was discontinued on December 19, for lack of sand and gravel. About 150 lin. ft. of steel piling were driven around the lower approach wall. Considerable work was done in the way of preparing plant for winter weather.

Quantities: Excavation, 4,682 cu. yds.; concrete, 497 cu. yds.; steel piling, 5,181 sq. ft.; iron and steel, 1,141 lbs.

Contract B.— For excavating a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from Cayuga lake to Seneca Falls and from Waterloo to deep water in Seneca lake.

The dredge *Clyde* removed 117,344 cu. yds. of material from the prism, along the new tangent provided by Alteration No. 1, from a point north of Free bridge to Kipp's island. Materials for dikes have been distributed along the shores at different points north of the present location of the dredge and posts for the dikes have been cut from the Parker property.

Water-Supply.

Contract No. 50.— For constructing dam, waste-gates and spillway across West Canada creek, at Hinckley.

The only work done on this contract during December was the cutting of a small amount of pulp wood and a few railroad ties by local parties. Some repairs were made to machinery.

Contract No. 51.— For constructing a canal feeder from Trenton Falls on West Canada creek to Nine-Mile creek below South Trenton, with gate-house, culverts, highway, etc.

Some clearing was done on the Delevan and Peckham parcels. The Browning excavator continued operating in prism, Browning shovel No. 1 continued on feeder prism cut, placing a small amount of wet material within embankment lines. Quantities: Excavation, 12,642 cu. yds.; embankment, 2,510 cu. yds.

Contract No. 55.— For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black River canal, with four locks and aqueduct over Mohawk river, highway change, bridges, etc.

Fencing was removed and refuse at building sites destroyed. Some 483 cu. yds. were excavated by hand at the outlet of the Black River canal feed pipe. The section of the main dam where the old Black River canal passed, was completed and the closure section in the Mohawk river partly built up. High water delayed this work. On December 23 the floor of the cement storage house was flooded to the depth of about four feet. The valve chamber in the 30-in. canal feed pipe and the slope wall in mortar at the southwest corner of the aqueduct were completed. About 150 lin. ft. of 30-in. cast-iron pipe were laid, the sluice-gate apparatus was painted and the interior brickwork in the upper gate house was completed. Quantities: Concrete, 58 cu. yds.; Cyclopean masonry, 2,160 cu. yds.; cast-iron pipe and specials, 51,712 lbs.; structural steel, 844 lbs.; reinforcement, 993 lbs.; wrought-iron, 263 lbs.; plain castings, 439 lbs.; machined castings, 21,240 lbs.

About 6,844 cu. yds. were excavated, 4,479 cu. yds. of embankment formed and 1,950 cu. yds. of dry stone work built on the adjacent highways.

Contract No. 55-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 55, Delta reservoir, to a new cemetery outside the flow lines.

No work was done on this contract during the month.

Power-Supply.

Contract No. 91.— For building and equipping a hydro-electric power-plant on the Erie canal near the east end of Crescent dam.

Excavation of loose material within the coffer-dams in front of the draft tubes was completed and about 210 cu. yds. of concrete placed.

Contract No. 90.— For constructing hydro-electric power-plants at Baldwinsville on the Erie canal, and at Smiths, Comstock and Whitehall on the Champlain canal. Also for constructing equipment for operating and lighting the following locks: No. 24, Erie canal; Nos. 1, 2, 7 and 8, Oswego canal; Nos. 9, 11 and 12, Champlain canal.

On the Erie canal:

At Lock No. 24, Baldwinsville, very little work was done. Machinery and interior of power-house were painted and miscellaneous electrical work carried on. Current was put on the lamps, carbons adjusted and four 7½-hp. motors installed.

On the Champlain canal:

At Lock No. 9, work progressed in setting motor boxes in recesses, splicing cable, placing roof on power-house, cleaning and oiling capstan machinery, painting power-house, erecting generator and switchboard, etc. Three 7½-hp. motors were placed.

At Lock No. 11, work progressed in placing roof on power-house, cleaning generator and erecting switchboard, placing governors in position, etc.

At Lock No. 12, work was done in placing duct in recesses, removing forms and finishing interior of power-house, placing doors and windows and painting, putting roof on power-house, chipping concrete for cover plates, making cover plates for recesses in power-house, cleaning, oiling and painting generators and turbines.

On the Oswego canal:

At Locks Nos. 1 and 2, no contract work was done.

At Lock No. 7, some 2,533 lbs. of gate-operating machinery and three 7½-hp. motors were installed and some miscellaneous electrical equipment placed.

At Lock No. 8, 724 lbs. of metal duct were placed.

Progress of Plans Being Prepared.

The following pages contain detailed accounts of the plans in process of preparation at the main and residency offices, showing progress up to the first of January. An order according to location is followed, as explained in the account of contract work for the month.

Erie Canal.

Contract No. 74.—For dredging Mohawk river from Hudson river to Contract No. 2-E. Plans held for further consideration.

Contract No. 18-A.—For completing the construction of the canal from Mindenville to Castle creek. Plans 83 per cent completed.

Contract No. 101.—For the construction of a steel highway bridge superstructure at Three River Point. Plans 99 per cent completed.

Contract No. 57.—Syracuse harbor. Plans completed, but held for further consideration.

Contract No. 105.—For the construction of five lift-bridges at Clyde, within the limits of Contract No. 47. Work on plans suspended, pending an investigation as to elimination of grade crossing.

Contract No. 89.—For the construction of steel highway bridge superstructures at Main avenue and East avenue in Newark, Allerton's, Peak's, foot of Lock No. 28-B and Limerick; all within the limits of Contracts Nos. 76 and 77. Plans 99 per cent completed.

Contract No. 59.—For constructing a movable dam in the Genesee river at Rochester. Plans 90 per cent completed.

Contract No. 105.—For the construction of five lift-bridges between Rochester and Lockport. Plans 90 per cent completed.

Contract No. 65.—For work from the west end of Contract No. 9, at a point near Beal's bridge, to the east end of Contract No. 64, at a point 600 feet west of Prospect street, Medina, including Oak Orchard creek crossing. Plans nearly completed, but held, pending decision as to whether Oak Orchard creek shall be crossed by aqueduct or otherwise.

Champlain Canal.

Contract No. 56.—Glens Falls feeder. Plans 85 per cent completed.

Oswego Canal.

Contract No. 103.—For the construction of a reinforced concrete arch bridge over part of the Oswego river at Phoenix. Plans 80 per cent completed.

Cayuga and Seneca Canal.

The contracts on this canal may be rearranged. For the present issue the old order is retained.

Contract C.—For constructing Lock No. 2 and Dam No. 2, near Demont's bridge. Plans under revision.

Contract D.—For constructing Lock No. 3 and excavating prism east of Seneca Falls. Plans under revision.

Contract E.—For constructing Lock No. 4 at Seneca Falls, three highway bridges, etc. Plans 70 per cent completed.

Contract G.—For dredging a channel in the Seneca river from Lock No. 4, at Seneca Falls, to Contract B, at Waterloo. Plans 50 per cent completed.

Contract F.—For constructing Lock No. 5 and dam at Waterloo. Plans 55 per cent completed.

Power-Supply.

Contract No. 92.—For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 2, 3, 4, 5, 6 and 7, on the Erie canal, and Locks Nos. 6 and 8, on the Champlain canal. Plans 95 per cent completed.

Plans before Canal Board.

Contract No. 10-B.—For completing the construction of the canal from the upper end of Lock No. 2, Fulton, north to Contract No. 37. Length 0.9 mile. Drawings, 43 sheets. Engineer's estimate, $515,044. To be completed before December 1, 1913. Plans adopted by Canal Board December 27. Being printed.

Contract Advertised.

Contract No. 5-A.—For the completion of Contract No. 5, from Mosquito Point to Campbell's bridge, including construction of Owasco creek entrance, reconstruction of bridge at Mosquito Point and new pier and approaches at Howland island bridge, etc. Length, 2.44 miles. Drawings, 14 sheets. Engineer's estimate, $395,285. To be completed 12 months from date of contract. Advertised; bids opened January 17.

Bids Opened.

Contract No. 104.—For the construction of a reinforced concrete arch bridge over the Barge canal at Broadway, Fulton. Bids were opened on December 20. Six bids were received, the details of which appear elsewhere in this issue.

Contract H.—For excavating a channel in Cayuga lake inlet at Ithaca from a point about 300 feet north of Cascadilla street, to deep water in Cayuga lake. Bids were opened on December 20. Three bids were received. The contract was subsequently awarded to James H. Dawes, No. 112 N. Broad street, Philadelphia, Pa., at $179,768.60.

RECAPITULATION — PROGRESS ON PLANS.

Contract No.	DESCRIPTION	Canal.	Progress on plans.
5A	Completion of Contract 5	Erie	Bids opened Jan. 17.
10B	Fulton, north to Contract 37	Oswego	Adopted by Canal Bd.
18A	Mindenville to Castle creek	Erie	83 per cent completed.
56	Glens Falls feeder	Champlain	85 per cent completed.
57	Syracuse harbor	Erie	Held for consideration.
59	Rochester harbor dam	Erie	90 per cent completed.
65	Aqueduct and bridge at Medina	Erie	Nearly completed.
74	Dredging, Hudson river to Contract 2-E	Erie	Under consideration.
84	Two lift-bridges at Clyde	Erie	Suspended.
89	Bridges on Contracts 76 and 77	Erie	99 per cent completed.
92	Power-house and lock equipments	Erie, Champlain	95 per cent completed.
101	Bridge at Three River Point	Erie	99 per cent completed.
103	Bridge at Phoenix	Oswego	80 per cent completed.
104	Bridge at Fulton	Oswego	Bids opened Dec. 20.
105	Five lift-bridges between Rochester and Lockport	Erie	90 per cent completed.
C	Lock 2, near Demont's bridge	Cayuga and Seneca	Under revision.
D	Lock 3 and prism, east of Seneca Falls	Cayuga and Seneca	Under revision.
E	Lock 4 at Seneca Falls	Cayuga and Seneca	70 per cent completed.
F	Lock 5 and dam at Waterloo	Cayuga and Seneca	55 per cent completed.
G	Dredging, Seneca Falls to Waterloo	Cayuga and Seneca	50 per cent completed.
H	Cayuga inlet	Cayuga and Seneca	Contract awarded.

Annual Report of State Engineer and Surveyor

To the Honorable The Legislature of the State of New York:

I have the honor to present herewith the annual report of the State Engineer and Surveyor for the year 1911.

The principal duty imposed upon the State Engineer is that of carrying on the work of enlarging the State canals, but other duties are imposed by the constitution and in accordance with such requirements during the past year I have attended meetings of the Canal Board, the Commissioners of the Land Office, the State Board of Canvassers, and the Board of Equalization of Assessment, and in accordance with chapter 646 of the Laws of 1911, the State Engineer was appointed a member of the State Highway Commission to perform duties along the line as nominated in the above law.

Under chapter 734 of the Laws of 1911, the State Engineer was made a member of the commission to investigate port conditions and pier extensions in New York harbor, and I therefore deem it proper that a reference to this subject should be made in this report. In conformity with the duties imposed, frequent meetings of this commission have been held, and it is gratifying to be able to report, that under permit which had been secured from the United States Government, a temporary extension to the pier headline in the transatlantic district of Manhattan Island has been secured, which enabled the city of New York to continue to be able to offer the proper accommodations for the largest steamships afloat.

The Commission of this State, acting in conjunction with one of like nature appointed by the Governor of the State of New Jersey, is now at work mapping new pier headlines for the harbor of New York, including that portion of the State of New Jersey lying within the port of New York. When this work will be accomplished, it will be the first work of the kind which has been done by the State since the lines were originally established by the last State Commission in 1855, and the changes which have come by commercial development are such as to render it imperative that the commercial interests of the State of New York, which practically

represent that of the country, should have a commission with the power of the State behind it to plot pier and bulkhead lines, and submit the same, it is to be hoped, along with those of the New Jersey Commissioners to the United States Government officials for approval.

The changes which have taken place within a short period of time in the size of the steamships entering the port of New York are extreme. This is manifested by the fact that since 1889 it has been necessary for the city to rearrange and change the transatlantic terminals on Manhattan Island, three separate times, so as to make it possible for the largest steamships to dock on the Manhattan Island waterfront. At this time it is still the desire of the transatlantic trade to continue to dock on Manhattan Island and there seems to be no possibility in the immediate future of a change, although at other locations in the port of New York there are piers of sufficient length to accommodate at the present time, and without alterations, the largest ships now built. Just exactly what the outcome of this situation is going to be, no one, I think, can tell at present, but the establishment of the commission referred to by the State should convince the people that the State has taken a step along the line of trying to adapt the port conditions to the requirements of commerce, and thus preserve for the State of New York its position of paramount importance in the commerce of the country, and do all that is possible to retain the prominence of the port of New York in its relation to the city, the State and the country at large.

During the past year surveys at various localities have been made for the Attorney-General and the Department has also cooperated with the United States Geological Survey in the topographic survey of the State, has proceeded with the work of gaging streams in the State and has also surveyed and monumented that portion of the lines previously unmonumented defining the boundaries between the State of New York and adjacent states and the province of Canada.

Canal Maintenance.

The maintenance of the canal system has been provided by various special acts of the Legislature, but the design and construction of the new work necessary has been made by the State Engi-

neer acting in conjunction with the Superintendent of Public Works, in whom is vested all questions in regard to the operation of the existing canal system.

During the past year but one break has occurred in the canal which in any way interfered with its operation, and although this was of quite extensive proportions, the break was repaired with a minimum hindrance to navigation. Several stretches of the Barge Canal are now practically completed and are a part of the existing system and the maintenance of these sections under the direction of the Superintendent of Public Works should be provided for during the time that the remaining work is under construction.

Present State of Work on Barge Canal.

At the beginning of the year 1911, six years after the commencement of the construction of the Barge Canal, there had been awarded in all 81 contracts for the work of construction, 8 of these contracts had been completed and 5 other contracts had been terminated for reasons. I also found 10 contracts which had been so recently let as not to be operative when work for the year commenced. Of the 81 contracts referred to above at the beginning of the year 1911 nearly one-half of these were noticeably backward in progress. During the past year, however, considerable work has been done on these backward contracts and it may be said that at the present time about 86 per cent of the amount of work which should be done under these backward contracts has been completed.

Record for the Year 1911.

During the year construction work to the value of $15,362,284 has been done. This is 60 per cent more than the highest yearly record heretofore and is three-fifths of the amount of work that had been done in the six preceding years. The accompanying diagram shows graphically the accomplishment of work under contract during the year.

Progress of the Removing of Obstructions at Railroad Crossings.

At several locations along the line of the new Barge Canal the work of construction had been hampered and in some cases stopped

DIAGRAM SHOWING PROGRESS OF BARGE CANAL CONSTRUCTION DURING 1911.

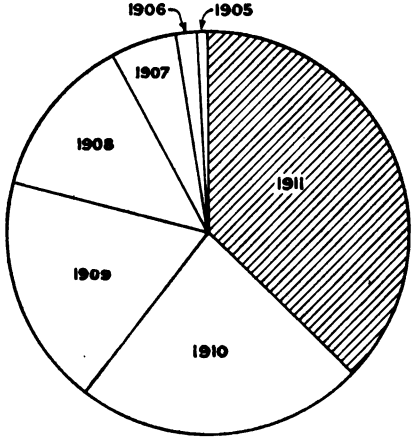
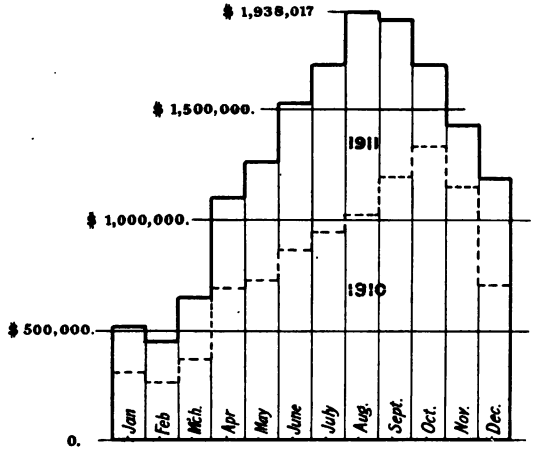


Diagram showing by years proportionate amount of construction work done to Jan. 1, 1912.



Value of construction work done during 1911, by months, in comparison with highest previous year.

by the fact that no negotiations had been consummated for the necessary rearrangement of the contracts along the railroads' right of way. Throughout the length of the Barge Canal there are 86 separate crossings and in the majority of cases changes are necessary in the grade of the railroad and the requirements also necessitate new bridges being erected. Negotiations have been consummated for some of the most important of these crossings and the work where such negotiations have been completed is now under way by the railroad companies. Previous to the present year but little had been done in this regard and the nature of the work is both difficult and troublesome on account of the features which enter into the question of damage and the difficulty of maintaining the traffic while the work is in progress. During the past year six agreements have been consummated with the railroad companies and at eight other locations construction work has been started by the railroad companies and negotiations are at present pending at numerous other places and the progress of the canal work is but little hindered except at two localities which are now under way for settlement.

Troy Dam.

During the year 1910 action was taken by the previous Canal Board in an effort to cancel existing leases of the water not necessary for navigation purposes at the Troy Dam. Early in the year discussion arose as to the right of the Canal Board to cancel in the manner which they did these existing leases on which depended the carrying on of certain portions of the work necessary for navigation at this locality by the United States Government. In accordance with the opinion of the Attorney-General the previous action by the Canal Board was not deemed proper and was rescinded. This brought about some discussion between the State authorities and the United States Government as to the building of the Troy Dam, and while the questions at issue have not as yet been definitely decided it is hoped that in the near future the work of constructing the Troy Dam may be undertaken by the State in such manner as was originally contemplated when the people voted the $101,000,000 for the improvement of the canal system, to extend from Congress Street,

Troy, to Buffalo, and thus preserve for the benefit of the people the water which will be collected by the dam and which will not be needed for purposes of navigation. I am of the opinion that the State should construct this portion of the canal system in accordance with the vote of the people and thus secure the control and operation for the benefit of the people of not only the lock, which will be the throat or entrance to all of the State canal system, but also the water which will be available for power. What the possibilities may be in the way of the use of water for power which is not needed for navigation no one at the present time, I think, can safely prophesy, but it is certainly desirable that the State shall not relinquish its rights in these waters because it does not see any large returns in the immediate future. In the early history of the State the rights of the waters not needed for navigation were given away for nominal sums and subsequently it may be seen that these waters have been developed by private interests and have proved to be of large and extensive value to those who were the recipients of the State's favor in the early years of the nineteenth century.

In this connection attention is called to the conflicting provisions of certain statutes having reference to the sale or disposition of surplus waters or power created as a result of the Barge canal improvement, particularly chapter 494 of the Laws of 1907, amending the Barge Canal Law, and section 400 of the State Conservation Law enacted by the Legislature of 1911. Careful consideration should be given to this question. Keeping in mind the fact that payments in connection with structures for the Barge canal system are made from funds appropriated for the purpose of the canal improvement, it would seem advisable to consider the enactment of legislation to the end that revenues derived as the result of such construction should be applied to the retirement of the bonds issued or for the payment of interest upon the same.

Work Under Contract.

At the present time the value of the contracts which have been let for the construction of the Barge canal amount to $74,950,318, and to the close of 1911 the work done amounts to $41,232,007.

The detail tables showing payments made under particular contracts are appended herewith.

To a great extent it may be said that the contracts as previously let were let with some haste and a lack of knowledge of the conditions existing. For this reason numerous alterations have been necessarily made in the contracts. In one case — that of the lock and dam at Scotia — the work has been abandoned by the contractor on account of the difficulties met with which were unexpected and unestimated at this locality. It has been necessary to redesign the dam and lock to meet the actual conditions. It was also found that somewhat the same conditions occurred with all of the bridges carrying the operating mechanism of all of the movable dams on the Mohawk river. As designed these bridges are too light for the purpose for which they were intended and it is a question whether it will be best to redesign these structures so that they may not only operate in the manner for which they were primarily needed, that of providing the mechanism for the raising and lowering of the movable dams, or to redesign them so that they may also serve as highway bridges, an addition that in many cases could be adopted at a small additional expense and would provide a desirable means of communication between the north and south banks of the river.

Two of the most important and necessary links of the Barge canal system were omitted from the previous contracts and these have received attention during the past year. One of these involves the location of the canal through the village of Medina and the other the lock and canal construction in the vicinity of Seneca Falls on the Cayuga and Seneca branch. The necessary preliminary steps for the preparation of the contracts at these localities have been made and contracts may be let in the immediate future.

In accordance with the authority vested under chapter 736 of the Laws of 1911, I appointed as consulting engineers on Barge canal work the following men:

George S. Greene, Jr., Mortimer G. Barnes, William H. Burr, T. Kennard Thompson and Joseph Ripley.

In all important subjects relating to changes in design or in the necessity for changes in contracts, these engineers have made

reports which are necessary, and the system under which they operate as consulting engineers, taking the place as they do of the former advisory board, is such that the Barge canal work has been expedited and the system has operated to the advantage of the State, due mainly to the fact that the consulting engineers perform their duties under the direction of the State Engineer and are available for consultation at all times.

The largest feature of construction which has been altered from the previous plans is that where a concrete trough has been substituted for the open excavation at Bushnell's Basin in the vicinity of Rochester, where the break referred to above occurred in the early part of the year. At this locality the old canal banks which has been assumed to be strong enough to support the canal with its new depth, were found insufficient and the contract originally let at this locality has been altered and amended to provide for concrete walls and bottom for the canal through this dangerous section of the work. As far back as 1852, the State as a result of a break in this locality was compelled to pay a considerable sum in settlement for damages suffered to abutting property owners, and as the canal occupies a high position above the surrounding country damage might result if any large break should occur in the future.

Board of Claims Surveys.

It has been the practice for many years past for the State Engineer's Department to make surveys and present evidence of an engineering character before the courts in litigation for damages alleged to have been suffered on account of the acts of the State, particularly in connection with the canal system. The evidence necessary in the majority of these cases is of a highly technical character, such as to require engineers competent to qualify in the particular branches of the profession. Such evidence is supplied by this Department for the use of the Attorney-General in defending cases before the Board of Claims, the expense incurred being defrayed from a special appropriation for this purpose. For continuing this work I therefore recommend that an appropriation of $5,000 be made, which is the same as that appropriated for the past year.

The remainder of this report will appear in a subsequent issue of the *Bulletin*.

BIDS FOR CONTRACT No. 101.

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		JOHN YOUNG, 1705 So. SALINA St., SYRACUSE, N. Y.		LON. B. CLEVELAND, CLEVELAND BLDG., WATERTOWN, N. Y.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.
Excavation	cu. yd	5,300	$0 80	$4,240	$0 70	$3,710 00	$0 80	$4,240
Forming embankment	"	5,000	30	1,500	25	1,250 00	35	1,750
Second-class concrete	"	720	7 50	5,400	7 00	5,040 00	8 50	6,120
First-class reinforced concrete	"	1,470	15 00	22,050	12 75	18,742 50	17 00	24,990
Structural steel	lb.	104,000	045	4,680	04	4,160 00	045	4,680
Metal reinforcement	"	32,000	035	1,120	03	960 00	035	1,120
Miscellaneous cast iron and steel	"	2,000	08	160	06	120 00	08	160
Brick pavement	sq. yd	1,650	2 20	3,630	2 10	3,465 00	2 20	3,630
Parapet walls	lin. ft	400	3 00	1,200	2 75	1,100 00	3 00	1,200
Wooden fence	"	400	20	80	20	80 00	20	80
Lamp posts and trolley poles	No.	8	30 00	240	30 00	240 00	30 00	240
Waterproofing	sq. yd	800	15	120	15	120 00	15	120
Furnishing and laying conduits	lin. ft., lump sum	820	.....	500	410 00	410 00	500 00	500
Bronze name plates	No.	2	80 00	160	75 00	150 00	80 00	160
Maintaining navigation	lump sum	.....	.....	100	75 00	75 00	100 00	100
Maintaining highway traffic	"	.....	.....	500	450 00	450 00	500 00	500
				$45,680	.....	$40,072 50	.....	$49,590
Deduct price for existing bridge superstructure	lump sum	.....	.....	100	100 00	100 00	100 00	100
Total	.....	.....	.....	$45,580	.....	$39,972 50	.....	$49,490

BIDS FOR CONTRACT No. 104 — (Continued).

ITEMS.	COUGHLIN & LOWMAN, WATKINS, N. Y.		C. T. HOOKWAY CONSTRUCTION CO., SYRACUSE, N. Y.		OWEGO BRIDGE CO., OWEGO, N. Y.		R. B. MURDOCK, CROWN POINT, N. Y.	
	Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.
Excavation	$0 80	$4,240 00	$0 60	$3,180 00	$0 80	$4,240 00	$0 80	$4,240 00
Forming embankment	30	1,500 00	20	1,000 00	30	1,500 00	30	1,500 00
Second-class concrete	7 50	5,400 00	7 00	5,040 00	7 50	5,400 00	7 50	5,400 00
First-class reinforced concrete	14 25	20,947 50	13 00	19,110 00	13 00	19,110 00	11 00	16,170 00
Structural steel	045	4,680 00	05	5,200 00	045	4,680 00	045	4,680 00
Metal reinforcement	03	960 00	04	1,280 00	035	1,120 00	035	1,120 00
Miscellaneous cast iron and steel	08	160 00	08	160 00	08	160 00	08	160 00
Brick pavement	2 20	3,630 00	2 00	3,300 00	1 80	2,970 00	2 00	3,300 00
Parapet walls	3 00	1,200 00	3 00	1,200 00	3 00	1,200 00	3 00	1,200 00
Wooden fence	20	80 00	20	80 00	20	80 00	20	80 00
Lamp posts and trolley poles	30 00	240 00	30 00	240 00	30 00	240 00	30 00	240 00
Waterproofing	15	120 00	15	120 00	15	120 00	15	120 00
Furnishing and laying conduits	500 00	500 00	400 00	400 00	500 00	500 00	500 00	500 00
Bronze name plates	80 00	160 00	80 00	160 00	80 00	160 00	80 00	160 00
Maintaining navigation	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00
Maintaining highway traffic	500 00	500 00	500 00	500 00	500 00	500 00	500 00	500 00
		$44,417 50	.....	$41,070 00	.....	$42,080 00	.....	$39,470 00
Deduct price for existing bridge superstructure	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00
Total	.....	$44,317 50	.....	$40,970 00	.....	$41,980 00	.....	$39,370 00

BIDS FOR CONTRACT H.

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		E. M. GRAVES, CLEVELAND, O.		JAMES H. DAWES, 112 NO. BROAD ST., PHILADELPHIA, PA.		CROWELL-SHERMAN-STALTER CO., CLEVELAND, O.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.
Excavation	cu. yd.	700,000	$0 20	$140,000	$0 248	$173,600	$0 21	$147,000 00	$0 22	$154,000 00
Removing old crib	"	3,644	50	1,822	1 00	3,644	40	1,457 60	60	2,186 40
Foundation piles	lin. ft	1,000	30	300	50	500	30	300 00	30	300 00
Fender piles, 30 ft. long	"	1,500	25	375	50	750	25	375 00	25	375 00
Sawed lumber	M ft. B. M.	230,000	50 00	11,500	65 00	14,950	40 00	9,200 00	60 00	13,800 00
Stone filling	cu. yd.	1,880	1 00	1,880	2 25	4,230	1 20	2,256 00	1 20	2,256 00
Second-class concrete	"	3,180	7 00	22,260	7 00	22,260	6 00	19,080 00	8 00	25,440 00
Moving ice-house	lump sum		100 00	100	100 00	100	100 00	100 00	100 00	100 00
Total				$178,237		$220,034		$179,768 60		$198,457 40

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FEBRUARY, 1912

Barge Canal Bulletin

Series V No. 2

DEPARTMENT OF

THE STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
ALEXANDER E. KASTL, Special Deputy State Engineer

ISSUED MONTHLY UNDER THE AUTHORITY OF THE STATE ENGINEER, BY THE BUREAU OF PUBLICATION AND REPORTS, DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR

CONTENTS

Progress of Contract Work 42
Brief Account of Contract Work for January 43
Progress of Plans Being Prepared 62
Plans before Canal Board 64
Contract Advertised 64
Award of Contracts 65
Annual Report of State Engineer and Surveyor (Second Part) 66
Total Amount of Construction Work to January 1, 1912 78
Bids for Contract No. 5-A 80

Progress of Contract Work.

Contract No.	CONTRACTOR.	Total Value of Work.			Per centage of work done to February 1, 1912.
		Put under contract.*	Done to February 1, 1908.	Done during January 1912.	
1	Empire Engineering Corporation.....	$580,424	$474,400	0	81.8
2	Ferguson Contracting Company *a*...	968,512	694,390	0	73.0
2E	Holler & Shepard *b*.....	(283,890)	251,130	$9,000	88.6
3	Sundstrom & Stratton.....	657,273	633,290	0	Finished.
4	Empire Engineering Corporation.....	726,780	720,073	0	Finished.
4B	E. J. Doyle & Company.....	1,351	1,332	22	Finished.
5	Empire Engineering Corporation *a*...	156,941	125,820	0	Finished.
5A	James Stewart and Company *b*.....	(317,597)	0	0	0
6	F. A. Maselli.....	1,026,550	1,033,864	8,154	Finished.
7	Groton Bridge Company.....	101,930	98,929	0	Finished.
8	Pittsburg-Eastern Company *a*.....	1,516,789	920,420	0	60.7
9	Thomas Crimmins Contracting Co...	803,297	655,461	0	Finished.
10	McDermott Contracting Company *a*.	1,111,965	668,360	[0	60.1
10A	The T. A. Gillespie Company *b*.....	(106,738)	1,120	1,120	1.0
11	Fort Orange Construction Company..	1,352,999	1,154,410	0	85.4
12	James Stewart & Company.....	3,555,467	2,366,560	0	6.66
13	Penn Bridge Company.....	28,126	20,180	0	71.7
14	Acme Engr'g & Contracting Co.	2,985,225	2,443,070	4,070	81.8
14R	Thomas F. Riley.....	724	470	20	65.0
15	Atlantic, Gulf & Pacific Company...	1,481,692	1,363,630	0	Finished.
16	United Construction Company.....	78,715	16,380	8,720	20.8
17	The Scofield Company *a*.....	842,418	57,560	0	6.9
17	Alexander Murdoch *b*.....	(812,286)	743,610	1,040	91.5
18	Kelley Bros. Contracting Company..	611,382	476,979	0	Finished.
19	Great Lakes Construction Company..	891,401	712,480	1,720	79.9
20A	Houston Barnard.....	490,592	187,050	9,040	38.1
20B	S. Pearson & Son, Inc.....	933,194	258,960	0	27.7
20C	American Pipe & Construction Co.	585,720	395,890	1,760	67.6
20D	American Pipe & Construction Co...	2,685,477	84,920	0	3.2
21	Lane Brothers Company.....	1,323,150	560,550	8,100	42.3
22	M. Fitzgerald.....	117,194	20,520	260	17.5
23	Millard & Lupton Company.....	1,808,797	835,080	17,500	46.2
24	James D. Sherrill.....	44,368	3,360	420	7.6
25	Atlantic, Gulf & Pacific Company...	1,690,037	1,438,070	4,140	85.0
26	Lake Erie Dredging Company.....	40,057	35,443	0	Finished.
27	Kinser Construction Company *a*.....	723,269	378,650	0	Finished.
27A	Holler & Shepard *b*.....	(449,562)	109,650	10,350	24.4
29	Maryland Dredging and Contr'g Co.	674,250	405,680	1,630	60.2
30	Acme Engr'g & Contracting Co.....	2,558,955	1,032,850	4,890	40.4
31	Casey & Murray.....	835,474	682,050	5,070	81.6
32	Penn Bridge Company.....	46,797	44,375	0	Finished.
33	Penn Bridge Company.....	199,640	164,550	0	82.5
34	M. Fitzgerald.....	22,449	22,258	0	Finished.
35	Gilmour-Horton-Allen Company.....	748,045	509,610	1,650	68.1
36	J. D. Miller.....	46,800	29,250	5,850	62.5
37	Henry P. Burgard.....	2,357,088	960,770	330	40.8
38	Henry Tosh & Son.....	16,870	16,287	0	Finished.
39	James Stewart & Company.....	1,048,674	146,240	0	14.0
40	United Engr'g & Contracting Co.	2,299,902	1,458,680	81,160	63.4
41	Butler Bros. Construction Company..	273,238	241,644	0	Finished.
42	Shanley-Morrissey, Inc.....	1,047,366	469,470	8,600	44.8
43	M. A. Talbott Company.....	1,365,876	156,710	13,640	11.5
44	Scott Brothers.....	1,758,068	703,470	7,160	40.0
45	Scott Brothers.....	472,802	418,652	0	Finished.
46	Kinser Construction Company.....	1,291,805	693,100	1,620	53.7
47	Crowell-Sherman-Stalter Company...	1,279,328	783,110	4,460	61.2
48	Crowell-Sherman-Stalter Company...	1,670,695	312,430	38,760	18.7
49	American Pipe & Construction Co...	722,770	369,380	2,460	51.2
50	Buffalo Dredging Company.....	964,884	123,210	0	12.8
51	Alto Construction Company.....	389,842	87,230	2,970	22.4
53	Scott Brothers.....	167,585	164,576	0	Finished.
54	Hunkin-Conkey Construction Co...	250,590	88,180	6,440	35.1
55	Arthur McMullen.....	945,840	861,340	7,270	91.0
55R	Joseph Kalk & Alfred S. Brown.....	7,561	5,630	0	74.4
60	Empire Engineering Corporation....	1,491,317	1,218,950	4,490	81.9
61	Cleveland & Sons Company.....	1,088,890	651,760	11,990	59.6
62	I. M. Ludington's Sons, Inc.....	2,373,126	900,580	91,010	38.0
63	H. S. Kerbaugh, Inc.....	2,328,935	864,920	70,000	37.1
64	Empire Engineering Corporation.....	1,335,434	734,880	7,820	54.9

Progress of Contract Work—*Continued.*

Contract No.	CONTRACTOR.	Total Value of Work.			Per centage of work done to February 1, 1912.
		Put under contract.*	Done to February 1, 1908.	Done during January 1912.	
66	Empire Engineering Corporation	$829,284	$672,730	$7,730	81.2
67	Larkin & Sangster	1,149,401	406,000	39,960	35.3
68	Shanley-Morrissey, Inc.	1,042,736	945,490	0	90.7
69	I. A. Hodge & Company	240,061	182,080	1,220	75.8
70	Shanley-Morrissey, Inc.	779,636	236,240	0	30.3
71	Shanley-Morrissey, Inc.	1,561,119	816,130	25,600	52.3
72	Shanley-Morrissey, Inc.	1,202,658	618,900	0	51.4
73	E. M. Graves	518,829	517,223	*c* 1,767	Finished.
75	United Construction Company	42,917	0	0	0
76	The T. A. Gillespie Company	1,512,011	586,800	52,380	38.8
77	The T. A. Gillespie Company	1,669,640	708,550	35,810	42.5
78	Cunningham-Woodard Company	49,026	47,290	0	Finished.
79	Lupfer & Remick	37,480	33,730	20	90.0
80	Walter Bradley	117,391	107,710	19,850	91.7
82	Groton Bridge Company	28,841	19,610	1,150	68.0
85	Lupfer & Remick	13,238	1,930	0	14.6
86	Lathrop, Shea & Henwood Company.	43,440	4,940	0	11.3
88	Lathrop, Shea & Henwood Company.	25,658	0	0	0
90	D'Olier Engineering Company	180,318	153,210	7,460	85.0
91	The Hollington Company	42,940	6,740	130	15.7
	Totals	$73,093,336	$41,329,286	$654,249	.....
	Cayuga and Seneca Canal.†				
A	Scott Brothers	$357,627	$118,300	$5,310	33.1
B	Crowell-Sherman-Stalter Company	1,436,597	466,570	22,590	32.5
H	James H. Dawes	179,769	0	0	0.0
	Totals	$1,973,993	$584,870	$27,900	.....

* Includes all alterations in force to date. *a* Suspended by order of the Canal Board. *b* Relet to complete former contracts, contract price not included in total. † Authorized by separate appropriation. *c* A decrease, due to recomputation for final account.

Brief Account of Contract Work for January.

The following pages show what has been done during the month on the several contracts now in force on the Barge canal. The Erie canal contracts are described in order from Waterford west to Buffalo, and the Champlain and Oswego canal contracts follow, in order from south to north, while the Cayuga and Seneca canal contracts are given from east to west.

Erie Canal.

Contract No. 33.— Lock-gates and valves, guard-gates, etc., on Contracts Nos. 2, 10, 11 and 15.

The work on this contract is substantially completed, except at Lock No. 3, on Contract No. 10-B, now advertised.

Contract No. 16.— For eleven steel highway bridges, ten of which are at various points on Contracts Nos. 25 and 27, Champlain canal, and the remaining one on Contract No. 11, Erie canal.

At Dewey's bridge, the superstructure has been erected and work progressed in placing railing and trimming lumber for flooring. Erected 50,000 lbs. of steel.

At Brayton's bridge, erecting, riveting and trimming flooring progressed. Erected 145,970 lbs. of steel.

At Fort Ann bridge, steel and plant were assembled.

Contract No. 36.— For constructing sixteen operating winches for movable dams in the Mohawk river.

Winches have been installed at Dams Nos. 7, 8, 9, 10 and 11. Winches for Dams Nos. 4, 5 and 6 were delivered and stored.

Contract No. 13.— For three bridge superstructures on Contract No. 12 and two on Contract No. 18.

Work on this contract remains as on December 1.

Contract No. 2-E.— For completing the construction of the canal from the Mohawk river at Waterford to a point about one-fourth mile above the head of Lock No. 3.

The wall on south side was practically completed with 421 cu. yds. of concrete.

About 5,900 ft. B. M. of yellow pine, 7,696 lin. ft. of round timber and 189 cu. yds. of stone filling were placed in crib below Lock No. 2. The lower end was protected from ice.

Contract No. 11.— For prism excavation and construction from Contract No. 2 to Mohawk river below Crescent, including Locks Nos. 4, 5 and 6, highway, bridge abutments, guard-gate, masonry, etc.

Work closed for the winter.

Contract No. 14.— For work from Contract No. 11 to a point near Rexford Flats aqueduct, including Lock No. 7 and Dams Nos. 2 and 3; also for constructing Locks Nos. 13, 14 and 15, Dams Nos. 9, 10 and 11, Mindenville retaining dam, etc.

At Dam No. 2, surveying and monumenting lines completed.

At Dam No. 3, Lock No. 7, more plant was dismantled, trestle across south channel of river removed and repairs made. Cables

and counterweights were placed at the Stoney gate. The gate was lowered, leaving one valve open to prevent overflow. Operating machinery was adjusted and work closed down for the winter about January 20. Fenders were placed on approach walls.

At Dams Nos. 9 and 10 no work was done.

At Dam No. 11, Lock No. 15, rivets of lower gate were cut, gate straightened and again riveted. One upper and both lower gates were fitted with oak quoin and toe-posts. Both sets of gates were swung, accepted and closed for the winter. The fourth lock valve was placed in position. Upper and lower needles were removed, one set being left on the work and the other shipped to Lock No. 14. All plant was shipped away.

Contract No. 14-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 14, to new burial plots outside the flow lines.

A few markers were set at Crescent and Vischer's Ferry.

Contract No. 20-D.— For dredging Mohawk river channel, constructing stream entrances, etc., between deep water below Rexford Flats aqueduct and center of bridge at Dam No. 9, at Yosts.

About 150 cu. yds. of riprap stone were quarried and delivered at Danoscara creek and about 200 cu. yds. at Auries creek, for stream entrance work. Test soundings were made by contractors for estimating excavation. Hydraulic dredge calked and trusses are being placed.

Contract No. 8.— For constructing Dam No. 4 and Lock No. 8, at Scotia; Dam No. 5 and Lock No. 9, at Rotterdam; Dam No. 6 and Lock No. 10, at Cranesville, all on the Mohawk river.

At Dam No. 5, all uprights and gates were placed and raised. Girder span placed and nearly completed. Contact strips are being fitted, floor laid, stairs and railing erected.

At Dam No. 6, little work was done beyond repairing bridge planking.

Quantities: Lumber, 10,110 ft. B. M.; steel, 149,432 lbs.

Contract No. 17.—For constructing Dam No. 7 and Lock No. 11, at Amsterdam, and Dam No. 8 and Lock No. 12 at Tribes Hill.

Final estimates are being prepared.

Contract No. 20-C.— For dredging Mohawk river channel, constructing stream entrances, etc., between center of bridge at Dam No. 9, at Yosts, and center of bridge at Dam No. 10, at Canajoharie.

Riprap stone quarried. Test soundings made.

Contract No. 86.— For the construction of one span of a highway bridge over the Mohawk river at Canajoharie, to replace two existing spans, which will be removed.

False work was placed under defective span of bridge.

Contract No. 20-B.— For dredging Mohawk river channel, constructing stream entrances, etc., between the center of bridge at Dam No. 10, at Canajoharie, and the upper miter wall of the new lock at Mindenville.

No construction work done. Plant repaired, etc.

Contract No. 20-A.— For dredging Mohawk river channel, etc., between Castle creek and upper wall of lock at Little Falls.

Excavation of the land line progressed. The steam-shovel on the north side took out 11,306 cu. yds. of rock which was spoiled on south side. Drilling continued in advance of the shovel. Pumps drained the cut. A marine drill and electric lights were installed, using steam from boiler of tower-scraper.

Contract No. 31.— For improving the Erie canal at Little Falls, constructing Lock No. 17, and modifying the dam and constructing guard-gates at Rocky Rift.

Removal of coffer-dam west of Lock No. 17 was completed. Excavating in prism west of lock and for concrete at south abutment of guard-gate and both sides of sills was done. Large stone were spoiled. Smaller stone were used as riprap and fill for roadway. About 1,942 cu. yds. were excavated. About 391 cu. yds. of second-class concrete were laid, mostly in retaining wall No. 2. The west wing of south abutment of Hansen Ave. bridge and a section of retaining wall No. 4 were completed. About 129 cu. yds. of riprap were placed in rear of wall No. 1.

At Little Falls guard-gate, guide and track wheels were placed, details adjusted, gates lowered to sills and concrete trimmed. Some 2,046 lbs. of metal were used. Dowels were placed in rock at Hansen Ave. bridge. Forms were built at guard-gate. A construction trestle was erected, and mixer plant dismantled.

Contract No. 30.— For dredging channel in Mohawk river and land line from Little Falls to Sterling creek, constructing Lock No. 18 at Jacksonburg, Dam No. 14 and guard-gates at Herkimer, retaining dam at Frankfort, bridges, etc.

Over two-thirds of the contract clearing has been completed. At the east end of the contract about 3,400 cu. yds. of rock were removed by the Thew shovel and two guy derricks and stored in piles or spoiled on the Casler property. Alterations on the dredges *Herkimer* and *Clinton* continued.

At Lock No. 18 coffer-dams were advanced but no excavation was made. The upper gates are practically riveted and other steel work is being assembled. Winter conditions retarded excavation elsewhere. Tower No. 5 removed but 3,700 cu. yds. placing about half of this in embankment. About 408 cu. yds. of wash wall were placed. Tower No. 2 completed dikes on the Lamberson property.

Contract No. 29.— For excavating prism from Sterling creek to Oneida-Herkimer county line, constructing lock at Sterling creek, bridges, etc.

Debris from the N. Y. C. crossing was placed as backfill at the lock, suitable chunks of concrete being used as riprap for blind drain. Work on lock gates was suspended about the middle of the month and erection plant shipped elsewhere.

Contract No. 42.— For prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillway, stream entrances, culverts, etc.

The total excavation was 37,205 cu. yds., of which 33,443 cu. yds. were from south side of new river channel, 2,094 cu. yds. from lower approaches and 1,668 cu. yds. from lower approach walls to the lock. About 34,600 lbs. of structural steel and 1,600 lbs. of machined castings were used in Park Ave. bridge. About two-thirds of the bottom chords and floor beams and the expansion rollers and bearing plates were placed. Ten temporary bents are in position. Lidgerwood excavator No. 2 operated from south side of new channel, working west on three shifts. Excavation was delayed by severe weather and frozen ground, the latter requiring dynamiting. A Blake pump was placed in operation on south side to supply water to storage tank. The dredge was in operation, three shifts daily. The Thew shovel excavated from prism and for south wall until

January 19, when it was removed and a 60-ton Marion steam-shovel began excavating. Holes were drilled for dynamiting in cemented gravel by two Star drills. Material was removed by two trains to south bank. Severe weather delayed work.

Contract No. 43.—For constructing the canal from a point south of Oriskany road to about 1,500 feet west of Mud creek.

The *Stanwix* removed 47,454 cu. yds. from prism. About 72,497 lbs. of structural steel were used in Oriskany road bridge.

Contract No. 44.— For constructing the canal from about 1,500 feet west of Mud creek, west of Rome, to about three miles west of New London, including junction lock, Locks Nos. 21 and 22, bridges, culverts, spillways, stream entrances, etc.

About 16,013 cu. yds. were excavated, distributed as follows: In the prism, Marion shovel 1347 removed 2,014 cu. yds.; Marion shovel 883, 5,252 cu. yds.; Bucyrus shovel 841, 933 cu. yds.; tower No. 2, 5,326 cu. yds.; and tower No. 1, 957 cu. yds. At Lock No. 21, a derrick and clam-shell bucket took out 130 cu. yds. At Lock No. 22, tower No. 1 removed 1,401 cu. yds. Some 4,817 sq. ft. of second quality steel piling were used in lower south approach wall of Lock No. 21. About 676 lbs. of metal were used in the gates of this lock.

Contract No. 4-B.— For constructing a concrete highway bridge along Burdick's road, adjacent to Contract No. 4.

Final estimates approved by Canal Board, January 11, 1912.

Contract No. 12.— For excavating prism between Oneida lake and Mosquito Point bridge on Seneca river; constructing Lock No. 23 and other structures.

No contract work was done. Repairs to plant were made.

Contract No. 22.— Bridges on Contract No. 12.

At Free bridge four piles were driven.

At Bonta's bridge clay and gravel is being filled in around the steel sheet-piling driven at pier No. 1. The north two spans of the old superstructure were removed down to the bridge floor. This was supported by false work and traffic was maintained. About 92,579 lbs. of steel were delivered.

At Weedsport bridge the ferry was operated until January 11, when it was abandoned and traffic was directed across the ice. The work of shoring up the bridge was completed and at noon on January 18 traffic was resumed over the bridge.

Contract No. 46.—For the construction of the canal from Fox Ridge to the southeast corner of the town of Galen, including Lock No. 25, a movable dam at May's Point, bridges, etc.

The hydraulic dredge excavated 9,219 cu. yds. from prism until January 6, when ice compelled it to close down. Repairs are being made to plant.

Contract No. 47.—For the construction of the canal from the southeast corner of the town of Galen to a point near the N. Y. C. & H. R. railway crossing at Lyons, including Lock No. 26, a dam across the Clyde river, highway bridge, stream entrance, etc.

Plant has been overhauled and removed and a coffer-dam built at the site of the river dam. Miter-sills and needles were shaped and the steel work on lock gates is about 40 per cent completed. About 71,497 lbs. of steel were used.

Contract No. 48.—For the construction of the canal from a point near the N. Y. C. & H. R. railway crossing at Lyons to a point near the West Shore railway crossing at East Newark, including Locks Nos. 27 and 28-A, dam and power-house, retention dam across Canandaigua outlet, spillway, culverts, highway, bridge, approaches, etc.

The dredge *Lyons,* working slowly owing to extreme cold weather and hard material, removed 50,774 cu. yds. from prism. Installation of machinery on dipper-dredge *Erie* continued.

At Geneva St. excavation for retaining wall and placing concrete proceeded slowly. About 272 cu. yds. of concrete were placed. Plant was erected for abutments and foundation of old pier removed. At the lower approach wall of Lock No. 27 a small quantity of steel sheet-piling was driven. In the upper approach wall of Lock No. 28-A, 165 cu. yds. of concrete were placed, completing the wall. In prism west of the Poorhouse bridge the Browning crane took out 7,889 cu. yds. of material, about 3,000 cu. yds. of which were placed in embankment and the remainder spoiled. Quantities: Excavation, 59,641 cu. yds.; embankment, 3,000 cu. yds.; concrete, 428 cu. yds.

Contract No. 76.— For the construction of the canal from a point near the West Shore railway crossing at East Newark to a point about one-half mile east of Port Gibson.

Shovel No. 20, at the west end of the contract, removed 56,300 cu. yds. of material from the prism. Shovel No. 21, near by, took out 48,100 cu. yds. Rock was blasted ahead of the shovels.

Contract No. 77.— For constructing the canal from one-half mile east of Port Gibson to one-half mile west of Palmyra, including Lock No. 29, power-plant, bridges, culverts, etc.

The dredge *Palmyra* removed 8,264 cu. yds. of material from the prism, closed down about January 10 and is being overhauled for spring work. Under the embankment at the east end of the contract about 195,956 ft. B. M. of additional sheet-piling were driven. At the big cut, shovel No. 22 removed 33,631 cu. yds.

The work at Harrison's spillway was severely handicapped by cold weather. Only 169 cu. yds. were excavated by hand and 590 cu. yds. of concrete laid.

Maple Ave. bridge superstructure is complete except painting.

Contract No. 49.— For prism construction from a point about 500 ft. east of Yellow Mills bridge, about one mile west of Palmyra, to the Monroe county line, including Lock No. 30, sluice-gates, highway bridges, culverts, etc.

The Lidgerwood excavator removed from prism about 1,557 cu. yds. which were spoiled. A Williams traveler, working on dikes, removed 591 cu. yds. from prism. About 452 cu. yds. of wash wall were placed.

Frear's bridge superstructure is complete except painting.

At Wayneport bridge only 88 cu. yds. of concrete were placed owing to severe weather.

About 1,537 cu. yds. of prism embankment were formed.

Contract No. 63.— For enlarging present canal and constructing culverts, sluiceways, waste-weir, guard-gates, dock walls, bridges, highway changes, etc., between Wayne-Monroe county line and Kings Bend.

The Lidgerwood excavator continued operating in north side of the prism, casting its material either into north embankment or spoil. The Fogarty machine worked only half the month on

the new channel of Thomas creek. Four steam-shovels operated at various places in prism between Bushnell's Basin and Monroe Ave., Pittsford. Some of the material was used as puddle on the Cartersville embankment, the remainder being spoiled either in Cartersville wide waters or on north side west of Bushnell's Basin or west of Monroe Ave. bridge.

In prism near Wiltsie's bridge material was excavated by teams and scrapers and used in adjacent approaches. Other excavation was by teams and scrapers or by hand at culverts Nos. 28 and 33, Bushnell's Basin and Cartersville guard-gates, concrete trough at Irondequoit fill, Mitchell's, Main St. Pittsford and Cartersville bridges and for wash wall at various places.

Second-class concrete, plain and reinforced, was placed in trough at Irondequoit fill, at Knapp's, Mitchell's, Main St. Pittsford, and Monroe Ave. bridges, culverts Nos. 30 and 33.

At Bushnell's Basin and Main St. Pittsford bridges, superstructures were erected and riveting begun. Cast-iron pipes were placed in position at culvert No. 28.

Quantities: Excavation, 32,477 cu. yds.; embankment, 6,441 cu. yds.; concrete, 4,120 cu, yds.; wash wall, 233 cu, yds.; iron and steel, 422,201 lbs.

Contract No. 23.—For prism excavation between Kings Bend and Genesee river, and construction of Locks Nos. 32 and 33, guard-lock, bridges, culverts, etc.

Drainage pumps worked continuously at Lock No. 33 and East Henrietta road crossing. Shovel No. 938 worked till January 18 and was then replaced by shovel No. 667, excavating in prism and disposing of material on north side of Lock No. 32, and in spoil on south side. Shovels Nos. 1178 and 2449 continued excavating in prism between East Henrietta and West Falls roads, spoiling material on north bank near Clinton Ave.

Excavation by hand was done at Edgewood Ave., by-pass of culvert, West Henrietta bridge abutments and for culvert under north approach. Second-class concrete, plain and reinforced, was placed as follows: Lock No. 33 and lower approach wall, 1,170 cu. yds.; by-pass culvert under Edgewood Ave., 68 cu. yds.; bridge abutments, 79 cu. yds. About 5,980 lbs. of metal reinforcement were placed. Kingsley road bridge has been opened to traffic. Edgewood Ave. bridge is completed, except masonry copings. South Ave. bridge is riveted and Clinton Ave. bridge about 75 per

cent erected. Extreme cold weather has hampered concrete work and excavation. Large quantities of concrete material and coal were delivered at Lock No. 3. Quantities: Excavation, 28,318 cu. yds.; concrete, 1,317 cu. yds.; iron and steel, 10,642 lbs.

Contract No. 21.— For prism excavation and construction of bridge abutments, guard-lock, etc., from the Genesee river west 2.56 miles to a point just west of the N. Y. C. & H. R. railway crossing.

Electric drainage pumps continued operating. Shovel No. 3 worked half the month and shovel No. 4 the entire month, removing 15,263 cu. yds. of material from prism to spoil. Five channeling machines surfaced 3,625 sq. ft. of rock. Fourteen steam-drills operated ahead of the shovels.

Contract No. 82.—For constructing three steel highway bridge superstructures on Contract No. 21, near Rochester.

The superstructure of the Scottsville road bridge has been erected and riveted and nailing strips are being bolted on. Quantities: Iron and steel, 23,708 ibs.

Contract No. 6.— For prism excavation and construction of five bridge foundations between a point just south of Buffalo road and another point near South Greece and southwest of Rochester.

Final estimates approved by Canal Board, January 31, 1912.

Contract No. 75.— For construction of three guard-gate superstructures on Contracts Nos. 60, 61 and 64.

Steel for towers and gates has been delivered at Spencerport and Brockport, and work has begun at the latter gate.

Contract No. 60.— For prism excavation and construction of culverts, bridge structures, etc., between a point 1.75 miles east of South Greece and a point 0.5 mile west of Adams Basin.

Prism excavation, trimming bottom and slopes and excavation for puddle has been continued in several places by use of shovelers and Koppel cars hauled by teams and also by the locomotive crane. Material was placed partly in north approaches of bridge No. 95, some on tow-path adjacent to excavation and the remainder temporarily spoiled to be rehandled later for embankment. Steam-drills are in operation at several places.

At bridge No. 96 the riprap protection on south side is completed and a temporary tow-path bridge is being built in front of north abutment. Quantities: Excavation, 6,222 cu. yds.; embankment, 4,856 cu. yds.

Contract No. 61.— For prism excavation and construction of culverts, bridges, waste-weir, etc., between a point 0.5 mile west of Adams Basin and Monroe-Orleans county line.

Lidgerwood excavator No. 1 removed material previously spoiled in prism, casting it into the north embankment, to be rehandled later when the frost is out. Lidgerwood excavator No. 2 operated in prism the first half of the month, casting material into north embankment. Lidgerwood excavator No. 3 operated in prism, casting part of its material directly into embankment, temporarily spoiling some outside embankment limits to be rehandled later, and sending the remainder in wagons to another part of the north embankment. Some excavation of earth and rock was done by hand, teams and scrapers and wagons at culverts Nos. 58 and 59, bridge No. 110, and at various places in the prism, including some trimming of slopes. The concrete bottom of culvert No. 59 has been laid and the Brockport vertical wall completed between Park avenue and Smith street.

At bridge No. 109 riveting is completed and nailing strips bolted in place. At bridge No. 110 piles for north abutment were driven. Quantities: Excavation, 17,022 cu. yds.; embankment, 5,860 cu. yds.; concrete, 72 cu. yds.

Contract No. 62.— For prism excavation and construction of culverts, bridge substructures, etc., between Orleans-Monroe county line and a point near Eagle Harbor bridge.

Albion section:

About 28,000 cu. yds. of material were excavated. This included work by steam-shovel, traveling derrick and clam-shell west of Brockville bridge, steam-shovel and locomotive crane west of Transit bridge, orange-peel bucket east of culvert No. 73, team outfit east of Bidwell's bridge and Lidgerwood excavator east of culvert No. 85; also, at culverts Nos. 71, 73, 78, 82 and 83, at north abutments of Brockville, Hindsburg, Bidwell's, Hall's and Transit bridges, at south abutment of Brockville bridge, south vertical wall at Albion, Lattin's guard-gate, Eagle Harbor trough and waste-weir.

About 12,000 cu. yds. of embankment were formed. This included work by team outfits east of Bidwell's and west of Brockville and Lattin's bridges, by clam-shell west of Brockville bridge, locomotive crane west of Transit bridge, and Lidgerwood excavator at culvert No. 85.

About 2,130 cu. yds. of concrete were laid. This included second-class at Hindsburg, Transit and Hall's bridges, Eagle Harbor trough and waste-weir, south vertical wall at Albion and Lattin's guard-gate; third-class at culverts Nos. 78 and 83; reinforced at culvert No. 71 and Transit bridge.

About 445 cu. yds. of wash wall were laid on berme near Gaines bridge and Lattin's guard-gate; 116,490 lbs. of cast-iron pipe were laid at culverts Nos. 78 and 83; 16,700 lbs. of metal reinforcement used at Eagle Harbor trough.

Holley section:

About 25,700 cu. yds. of material were excavated. This included work by shovel near McCarthy's bridge and east and west of Hulberton, by shovel and traveling crane at Holley trough wall, for Hulberton wall, and at Holley waste-weir and culverts Nos. 63 and 70. About 9,000 cu. yds. of embankment were formed on tow-path side.

About 1,370 cu. yds. of concrete were laid, at Holley wall and water-weir, County Line bridge and in weights at McCarthy's guard-gate. Some 1,400 cu. yds. of rubble masonry were laid near Hulberton. At culvert No. 63, 103,400 lbs. of cast-iron pipe and specials were placed. About 120,552 lbs. of steel were placed at County Line bridge and 4,781 lbs. of metal reinforcement placed at Holley trough.

Contract No. 64.— For improvement from 600 ft. west of Prospect street, Medina, to 100 ft. east of Gasport bridge.

About 4,300 cu. yds. of material were excavated from prism by team outfits and Thew shovel and at guard-gate and approaches east of Gasport. Some 3,300 cu. yds. of embankment were formed at various points. About 429 cu. yds. of second-class concrete were placed at Middleport waste-weir and at guard-gate east of Gasport. About 111 cu. yds. of riprap were placed at Hurd's and Williams bridges. Some 235 cu. yds. of wash wall were built on tow-path side.

Contract No. 66.— For prism excavation and constructing bridges and approaches, culverts, etc., from 100 ft. east of Gasport bridge to 600 ft. east of Lockport locks.

The total excavation for the month was 9,644 cu. yds. At Gasport, the Browning crane equipped with scale buckets removed 2,664 cu. yds., mostly rock. Between culvert No. 118 and Millard's bridge the Wellman-Seaver crane and the derrick-boat excavated 2,983 cu. yds. from the prism and 872 cu. yds. from the puddle notch in the bottom. About 972 cu. yds. were placed in embankment. At various places between culverts Nos. 118 and 120, about 193 cu. yds. were excavated from puddle notch and 300 cu. yds. of puddle bank protection were placed. Near culvert No. 120 on the berme side, 837 cu. yds. were excavated from the prism by slip scrapers and 951 cu. yds. were placed in embankment. The old timber invert of culvert No. 120 was removed and 74 cu. yds. of concrete substituted. The Marion steam-shovel and two trains, supplemented by hand labor, removed 2,032 cu. yds. of earth and rock from the prism between Chapel St. and the west end of the contract.

About 310 cu. yds. of lining were placed on the tow-path east of Millard's bridge and 16 cu. yds. of riprap at the bridge. Some 178 yards of wash wall were built at various points.

Contract No. 67.— For construction of Locks Nos. 34 and 35 and approaches, etc., at Lockport.

The total excavation for the month was 10,519 cu. yds. The Thew shovel and one train removed 2,265 cu. yds. from prism near east end. One Bucyrus shovel and four trains removed 7,104 cu. yds. from Lock No. 34 up to January 25. The other Bucyrus shovel and the same trains later removed 1,150 cu. yds. from prism west of Lock No. 35. One channeler cut 725 sq. ft. of rock surface on the north side of Lock No. 34. Two other machines cut 178 sq. ft. on south side along Buffalo St. Quoin-plates were set for the upper gates at the head of Lock No. 35. Eleven girders, with a total of 549,944 lbs. of steel, were placed in the superstructure of Main St. bridge.

Contract No. 40.— For constructing the canal, culvert entrances, guard-gates, stream entrances, bridges, etc., from the Lockport locks to Sulphur Springs guard-lock.

The total excavation was 80,605 cu. yds., of which 5,983 cu. yds. were removed by Bucyrus shovel and three trains in the harbor section; 19,940 cu. yds. were removed by double-boom crane and steam-shovel one-half mile east of Hitchin's bridge;

5,227 cu. yds. were removed by derrick and hand labor near the Hinman road and placed in wash wall in the earth section to the west; 11,591 cu. yds. were excavated by steam-shovel and cableway, one-half mile west of Hinman road; the cantilever removed 15,193 cu. yds. east of Hawley's bridge; 9,533 cu. yds. were removed by the Browning excavator and tipple east of new guard-gate; cableway and hand labor excavated 1,529 cu. yds. around the guard-gate; 8,469 cu. yds. were excavated by steam-shovel and three trains east of guard-lock; a small Marion shovel and three trains removed 3,140 cu. yds. also east of guard-lock; a revolving shovel and three trains excavated 2,000 cu. yds. of silt from the west rock cut which was not estimated.

About 78 sq. ft. of channeling were cut by two machines just west of Prospect St. About 5,189 sq. ft. were cut by five machines working one-half mile east of Hitchin's bridge. One machine cut 332 sq. ft. west of Hinman road. All channeling machines have now been removed from the work. About 63 cu. yds. of concrete were placed in the west wing of the south abutment of the new guard-gate. About 7,217 cu. yds. of fourth-class riprap and 36 cu. yds. of wash wall were laid at various places between Hinman road and the guard-gate. Fabrication of guard-gates and Summit street bridge has begun.

Contract No. 19.— For prism excavation, rebuilding bridges, constructing masonry culvert, concrete-capped pile docking, etc., between Sulphur Springs guard-lock and mouth of Ellicott creek.

Total excavation was 2,871 cu. yds., of which 2,556 cu. yds. were removed by Marion steam-shovel and two trains west of the guard-lock. Work began on January 16. About 4,000 cu. yds. of silt were removed by cableway and hand labor near the guard-lock, but only 315 cu. yds. were estimated. About 1,500 cu. yds. of embankment were placed at the new timber dock being built at Martinsville. Material is borrowed from nearby spoil.

Champlain Canal.

Contract No. 70.— For dredging a channel in the Hudson river from outlet of Barge canal at Waterford to Lock No. 1.

No contract work done.

Contract No. 71.— For constructing Lock No. 1 and Dam No. 1, above Waterford, and dredging Hudson river from Lock No. 1 to lower Mechanicville lock.

At McBride's the remainder of the movable plant was brought ashore for the winter, but no contract work was done.

At Smith's pumping, drilling and blasting continued. The shovel cleaned up gravel and shale from the east toe of the shope.

At site of Lock No. 1 concrete was placed in the upper needle-sill and the upper buffer-beam was placed in position. A dam of poles and planks was placed at the needle-sill. All work was shut down on January 19.

Quantities: Excavation, 12,069 cu. yds.; concrete, 69 cu. yds.

Contract No. 69.— For constructing Lock No. 2, at lower Mechanicville.

Excavating for lock floor and framing timbers for quoin and miter-posts were in progress. The bridge was riveted. Counter-weight guides and extension rails were placed in the upper east valve-well. Quantities: Excavation, 869 cu. yds.; steel, 9,587 lbs.

Contract No. 72.— For dredging Hudson river from lower Mechanicville to Stillwater.

At Stillwater construction of a coffer-dam around submerged steam-shovel continued. Ice and cold weather caused slow progress. The hydraulic dredge, pile-driver, scow, etc., were placed in winter quarters in Lock No. 3, after much difficulty in getting through the ice. Work closed January 26. At Hart's, drills, boilers, etc., were removed and stored on shore. The dipper-dredge was engaged in closing and strengthening the coffer-dam.

Contract No. 68.—For constructing Lock No. 3, at Mechanicville; making prism excavation and constructing Lock No. 4, at Stillwater; prism excavation and Lock No. 5, at Northumberland.

Timbers were finished on upper gates of Lock No. 3.

Contract No. 73.—For dredging Hudson river from Stillwater to Northumberland.

The Champlain canal crosses the river near the upper end of this contract by a tow-path bridge and pool. This bridge cannot be removed for some time to come, without interfering with present navigation. About two-thirds of the work on the present contract has been done. As it could not be completed at present, the uncompleted portions were eliminated by an alteration and final estimates were prepared, which were approved by the Canal Board on January 31. The work remaining will be relet.

Contract No. 88.— For the construction of a steel highway bridge at Schuylerville, within the limits of Contract No. 73.

Work not yet begun.

Contract No. 1.—For dredging Hudson river from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; constructing Crocker's Reef dam and approaches to "Land Line," etc.

Work on this contract is closed down indefinitely.

Contract No. 24.— For constructing guard-gate at Crocker's Reef.

Rock excavation along the east toe progressed, material being spoiled. Excavated earth was used in embankment on west side. The railroad switch was placed and stone for wash wall is being quarried at Middle Falls to ship by rail. Excavation, 450 cu. yds.

Contract No. 54.— For constructing Lock No. 7, at Fort Edward.

The lock pit was practically excavated, 10,000 cu. yds. being removed, 2,500 cu. yds. of which was properly spoiled. An accident to the McMyler delayed work; it is nearly repaired. About 16,012 lin. ft. of foundation piles and 30,672 ft. B. M. of sheet-piling were driven, completing sheeting on west side and half way down east side.

Contract No. 27-A.— For completing the construction of the canal between the Hudson river at Fort Edward and the south end of Contract No. 25, at Dunhams Basin road.

About 5,401 cu. yds. were excavated, of which the two steam-shovels in prism removed 3,987 cu. yds., 118 cu. yds. came from wash wall notch on west side, and the remainder from siphon spillway and bridge abutments. About 2,036 cu. yds. of embankment were placed in new highway on west side north of Argyle street. About 167 20-ft. piles were driven and 17,000 ft. B. M. of sheet-piling used at bridge abutments. Coping was delivered for Baldwin avenue, Argyle street and Broadway bridges. On the east side, 536 cu. yds. of wash wall were placed.

The Baldwin avenue bridge over Bond creek is in place and bolted. Girders for East street bridge over Bond creek are in place. A temporary bridge was erected at Argyle street. Iron and steel used, 84,671 lbs.

Contract No. 25.— For prism excavation between a point 0.6 mile north of Comstock post-office and highway crossing at Dunhams Basin; constructing Lock No. 9, spillways, power-plant, etc.

About 4,164 cu. yds. of material were removed, of which 1,145 cu. yds. were borrowed for embankment at Fort Ann bridge and the remainder was excavated from rock cuts at four points. About 1,930 cu. yds. of embankment were formed, of which 1,828 cu. yds. were on east side at Fort Ann bridge and the remainder on west side at Comstock bridge. Some 8,580 ft. B. M. of sheeting and bracing were used, mostly at Comstock bridge. Ten 15-ft. piles were driven and 419 cu. yds. of concrete laid at lower approach wall of Lock No. 9. About 102 cu. yds. of riprap were laid at Dewey's, Comstock and Smith's Basin bridges.

Contract No. 15.— For prism excavation and constructing Lock No. 11, Dam No. 4; Lock No. 12, Dam No. 5; spillway, culverts, highway, bridges and other structures between a point 0.6 mile north of Comstock post-office and Lake Champlain at Whitehall. Final estimates are being prepared.

Oswego Canal.

Contract No. 39.— For dredging channel in Oswego river, constructing stream entrances, excavating through Hinmansville cut-off, etc., between Three River Point and Fulton, except portion covered by Contract No. 53. No contract work was done.

Contract No. 85.—For constructing a steel bridge over the lock at Phoenix. No contract work was done.

Contract No. 80.— For constructing a concrete dam across the Oswego river at Phoenix.

Work at the north head-gates included excavating 64 cu. yds., the use of 2,170 ft. B. M. of yellow pine lumber, placing 53,748 lbs. of metal in wates and 321 lbs. in valves. Five class "A" and twelve class "B" gate-hoists were also placed. In the Taintor gates 136,689 lbs. of metal were placed.

Contract No. 10-A.— For completing the construction of the canal, raising the upper dam, etc., from Broadway bridge, Fulton, south to Contract No. 39.

A considerable portion of the old plant, debris, etc., were removed, 600 cu. yds. were excavated from the prism and 50 cu. yds. of embankment were formed at guard-lock No. 3.

Contract No. 78.— For constructing a dike on Oswego river, near Fulton. Final estimates being prepared.

Contract No. 79.— For the construction of two spans of a highway bridge over the river at Bridge street, in connection with six other similar spans to be constructed by the city of Oswego.

Very little work was done on the contract.

Contract No. 37.— For dredging a channel in Oswego river, constructing Locks Nos. 5 and 6, dams, bulkheads and other structures, and the removal of Battle Island and High dams, between Contract No. 10, at Fulton, and Contract No. 35, at Oswego. About 193 cu. yds. of material were excavated at Battle Island cut-off.

Contract No. 35.— For prism excavation and constructing Locks Nos. 7 and 8, bulkheads, culverts, spillways, etc., between a point one-half mile above Utica street bridge and harbor line north of Bridge street, at Oswego.

At the east upper approach of Lock No. 8, 140 cu. yds. of concrete were laid, 122 lbs. of reinforcement, 777 lbs. of castings and 23 lbs. of fender fastenings were used. At the east lower approach of Lock No. 7, 73 cu. yds. of concrete were laid.

Cayuga and Seneca Canal.

Contract A.— For constructing Lock No. 1 and Dam No. 1, near Cayuga.

The two travelers equipped with clam-shell buckets continued excavating in the lock, removing about 5,000 cu. yds. The material was hard and required considerable blasting. Work was delayed by cold weather. Seventy pieces of steel piling were driven on the north end of the north approach wall. Some of the steel piling driven east of the east wall was pulled.

Contract B.— For excavating a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from Cayuga lake to Seneca Falls and from Waterloo to deep water in Seneca lake.

The dredge *Clyde* excavated 107,105 cu. yds. of material from the prism. On January 14th dredging ceased for the winter and overhauling the dredge began. Stakes for dikes on Kipp island were driven and braced ready for planking. The hull of a new house-boat, 16 ft. by 95 ft. was completed and will be used for quarters for the men.

Contract H.— For excavating a channel in Cayuga lake inlet at Ithaca from a point about 300 feet north of Cascadilla street, to deep water in Cayuga lake. Contract recently awarded.

WATER-SUPPLY.

Contract No. 50.— For constructing dam, waste-gates and spill-way across West Canada creek at Hinckley.

Some wood was cut by local parties.

Contract No. 51.— For constructing a canal feeder from Trenton Falls on West Canada creek to Nine-Mile creek below South Trenton, with gate-house, culverts, highway, etc.

A small amount of clearing was done. The Browning excavator was operated in the heavy cut where the feeder leaves Cincinnatus creek until January 12, when the machine was laid up for the winter. Shovel No. 1 continued excavation of the feeder prism. This machine is cutting approximately the full section. A small amount of wet material was placed within embankment lines. Quantities: Excavation, 6,212 cu. yds.; embankment, 279 cu. yds.

Contract No. 55.—For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black River canal, with four locks and aqueduct over Mohawk river, highway change, bridges, etc.

Excavating the pit for the outlet of the 30-in. Black River canal feed-pipe was completed and the foundation of the outlet chamber laid. Concrete was completed in the closure section of the main dam on January 18. Wrought-iron pipe-railing was erected at the ends of the highway change bridge and on the main dam. Plant, including concrete mixer, was removed from back of the dam and on January 30 all construction work was suspended. Quantities: Excavation, 717 cu. yds.; Cyclopean masonry, 1,039 cu. yds.; structural steel, 1,248 lbs.; railing, 375 lin. ft.

Work progressed on the adjacent highways. About 700 cu. yds. were excavated, 6 cu. yds. of concrete and 28 cu. yds. of dry stone work laid and nearly 8,000 ft. B. M. of sawed lumber used.

Contract No. 55-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 55, Delta reservoir, to a new cemetery outside the flow lines.

No contract work was done.

Power-Supply.

Contract No. 91.—For building and equipping a hydro-electric power-plant on the Erie canal near the east end of Crescent dam.

Teams hauling stone. Other work suspended January 3.

Contract No. 90.—For constructing hydro-electric power-plants at Baldwinsville on the Erie canal, and at Smiths, Comstock and Whitehall on the Champlain canal. Also for constructing equipment for operating and lighting the following locks: No. 24, Erie canal; Nos. 1, 2, 7 and 8, Oswego canal; Nos. 9, 11 and 12, Champlain canal.

Work at various locks consisted mainly in plastering, cleaning up, drawing cables, setting lamps, etc. At Locks Nos. 7 and 8, Oswego canal, considerable valve and gate-operating machinery was placed.

Progress of Plans Being Prepared.

The following pages contain detailed accounts of the plans in process of preparation at the main and residency offices, showing progress up to the first of February. An order according to location is followed, as explained in the account of contract work for the month.

Erie Canal.

Contract No. 74.— For dredging Mohawk river from Hudson river to Contract No. 2-E. Plans held for further consideration.

Contract No. 18-A.— For completing the construction of the canal from Mindenville to Castle creek. Plans 83 per cent completed.

Contract No. 101.—For the construction of a steel highway bridge superstructure at Three River Point. Plans 80 per cent completed.

Contract No. 57.—Syracuse harbor. Plans completed, but held for further consideration.

Contract No. 84.—For the construction of two steel lift bridges at Clyde, within the limits of Contract No. 47. Work on plans suspended, pending an investigation as to elimination of grade crossing.

Contract No. 89.—For the construction of seven superstructures and one substructure for highway bridges between Lyons and Palmyra on Contracts Nos. 48, 76 and 77. Plans 99 per cent completed.

Contract No. 59.—For constructing a movable dam in the Genesee river at Rochester. Plans 90 per cent completed.

Contract No. 65.—For work from the west end of Contract No. 9, at a point near Beal's bridge, to the east end of Contract No. 64, at a point 600 feet west of Prospect street, Medina, including Oak Orchard creek crossing. Plans are being prepared for a change of route, following practically the line of the present canal and crossing Oak Orchard creek at the site of the present aqueduct. Plans 30 per cent completed.

Champlain Canal.

Contract No. 56.—Glens Falls feeder. Plans 85 per cent completed.

Oswego Canal.

Contract No. 103.—For the construction of a reinforced concrete arch bridge over part of the Oswego river at Phoenix. Plans 95 per cent completed.

Cayuga and Seneca Canal.

The contracts on this canal may be rearranged. For the present the old order is retained.

Contract C.— For constructing Lock No. 2 and Dam No. 2, near Demont's bridge. Plans under revision.

Contract D.— For constructing Lock No. 3 and excavating prism east of Seneca Falls. Plans under revision.

Contract E.—For constructing Lock No. 4 at Seneca Falls, three highway bridges, etc. Plans 70 per cent completed.

Contract G.— For dredging a channel in the Seneca river from Lock No. 4, at Seneca Falls, to Contract B, at Waterloo. Plans 50 per cent completed.

Contract F.— For construcing Lock No. 5 and dam at Waterloo. Plans 55 per cent completed.

Contract I.— For improving the canal from deep water in Seneca lake to Montour Falls, about 2.75 miles. Plans under way.

Contract J.— For improving Glen creek from the highway bridge in the village of Watkins to the canal improvement. Plans under way.

POWER-SUPPLY.

Contract No. 92.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 2, 3, 4, 5, 6 and 7, on the Erie canal, and Locks Nos. 6 and 8, on the Champlain canal. Plans 95 per cent completed.

Plans before Canal Board.

Contract No. 105.— For the construction of five lift-bridges between Rochester and Lockport. Plans approved by the Canal Board on January 31, 1912.

Contract Advertised.

Contract No. 10-B.— For completing the construction of the canal from the upper end of Lock No. 2, Fulton, north to Contract No. 37. Advertised; bids opened February 27, 1912.

Award of Contracts.

Contract No. 5-A.—For the completion of Contract No. 5, from Mosquito Point to Campbell's bridge, including construction of Owasco creek entrance, reconstruction of bridge at Mosquito Point and new pier and approaches at Howland island bridge, etc.

Bids were opened on January 17. Four bids were received, the lowest being that of James Stewart & Co., of No. 30 Church street, New York, N. Y., to whom it was subsequently awarded at $317,597. The detailed bids appear elsewhere in this issue.

Contract No. 104.— For the construction of a reinforced concrete arch bridge over the Barge canal at Broadway, Fulton. Bids were opened on December 20.

RECAPITULATION — PROGRESS ON PLANS.

Contract No.	DESCRIPTION.	Canal.	Progress on plans.
5A	Completion of Contract 5	Erie	Awarded.
10B	Fulton, north to Contract 37	Oswego	Bids opened Feb. 27.
18A	Mindenville to Castle creek	Erie	83 per cent completed.
56	Glens Falls feeder	Champlain	85 per cent completed.
57	Syracuse harbor	Erie	Held for consideration.
59	Rochester harbor dam	Erie	90 per cent completed.
65	Canal and aqueduct at Medina	Erie	30 per cent completed.
74	Dredging, Hudson river to Contract 2-E	Erie	Under consideration.
84	Two lift-bridges at Clyde	Erie	Suspended.
89	Bridges on Contracts 48, 76 and 77	Erie	99 per cent completed.
92	Power-house and lock equipments	Erie, Champlain	95 per cent completed.
101	Bridge at Three River Point	Erie	80 per cent completed.
103	Bridge at Phoenix	Oswego	95 per cent completed.
104	Bridge at Fulton	Oswego	Bids opened Dec. 20.
105	Five lift-bridges between Rochester and Lockport	Erie	Adopted by Canal Bd.
C	Lock 2, near Demont's bridge	Cayuga and Seneca	Under revision.
D	Lock 3 and prism, east of Seneca Falls	Cayuga and Seneca	Under revision.
E	Lock 4 at Seneca Falls	Cayuga and Seneca	70 per cent completed.
F	Lock 5 and dam at Waterloo	Cayuga and Seneca	55 per cent completed.
G	Dredging, Seneca Falls to Waterloo	Cayuga and Seneca	50 per cent completed.
I	Watkins to Montour Falls	Cayuga and Seneca	Under way.
J	Glen creek at Watkins	Cayuga and Seneca	Under way.

Annual Report of State Engineer and Surveyor

(Continued From January Bulletin.)

Mapping Canal Lands.

The canal lands of the State are bounded by the so-called "Blue Line," shown on the old maps embracing the canal lands of the State and on file in the offices of the State Engineer and Surveyor and the State Comptroller. In 1834 maps of the surveys of the State canal lands had been made and certified to by the Canal Commissioners and filed in the office of the State Comptroller. These maps of 1834 are the only canal maps which have ever been made authoritative by certificate. Until the beginning of the Barge canal construction none of these boundary lines had ever been monumented. Since the establishment of such lines, land marks have been obliterated and changes have taken place so that with the advance of time it has become more and more difficult to retrace these lines.

During the past year under an appropriation made by the Legislature, two survey parties have been employed relocating the "Blue Line" and preparing new maps showing the same. The initial appropriation for carrying on this work is now nearly exhausted. The Blue Line should be relocated before the further obliteration of the various land marks by which the same may be identified, and it is therefore imperative that the continuity of this work be not interrupted, and I accordingly recommend that an appropriation of $10,000 be made for continuing this work.

State Boundary Lines.

Chapter 678 of the Laws of 1892 authorized the State Engineer and Surveyor to examine the monuments marking the boundary lines at least once every three years and to replace any of the injured or misplaced monuments. The total length of the State's boundary lines is 1,416 miles distributed about as follows: Canadian line, 431 miles; Vermont line, 171 miles; Massachusetts, 50 1-2 miles; Connecticut line to Long Island Sound, 81 miles; along the ocean around Long Island to the New Jersey shore, 262

miles; New Jersey line, 92 1-2 miles; Pennsylvania line, 344 miles, to the beginning of the Canadian line in the middle of Lake Erie. These boundaries are fixed by accepted agreements and are marked by natural water courses and also by monuments. In making examinations during recent years no serious difficulties have been found except along the Connecticut boundary. This line was in dispute for nearly two hundred years and about fifty years ago it was established and monumented by the New York Commissioners, although it was twenty years later before the Connecticut authorities accepted this line. These monuments, however, were not of a permanent character and their condition has been for some time unsatisfactory. During the last months of 1908 and in the seasons of 1909 and 1910, work of remonumenting this line had been in progress and was finished during the latter part of the year 1910. Detail statement of the work done is appended to the annual report of the State Engineer and Surveyor for the year 1910, which was practically final in character, and at the present time the above is called attention to in order to state that the whole work has been completed in a satisfactory manner.

The reports of representatives of the State Engineer's Department showing the condition of the boundary lines between New York and Vermont, Canada and New Jersey are appended to this report.

Certain of the monuments on the Pennsylvania and New Jersey boundaries are in need of resetting and replacing and an effort is now being made with the authorities of the adjoining states to secure their co-operation in replacing these monuments. To carry this work on for the coming year I recommend that an appropriation of $1,000 be made for this purpose.

Topographic Survey of the State.

For nearly twenty years New York State in conjunction with the United States Government has been making topographic surveys and maps of the territory of the State. For about three-quarters of the above period it was customary for New York to make an appropriation of $30,000 each year and a like amount was appropriated for this work by the Federal government. In 1905, however, the State of New York failed to make an appropriation, but the following year the Legislature again supplied funds, but re-

duced the amount. Since the latter mentioned year about $10,000 has been the usual yearly allowance and at the present time about 85 per cent of the total area of the State has been mapped, but the funds have so reduced the speed that at the present rate of progress nine years will be required to complete the survey. These maps are of value to every one in the State and are used particularly in connection with public or private enterprises that have to do with location and are therefore a necessary knowledge of topography. For continuing this important work I recommend that an appropriation the same as that of last year, namely, $10,000, be made by the Legislature and invite your attention to the consideration of the advisability of increasing the appropriation on the part of the State in order that this work may be brought to a completion at an earlier date than can possibly be done with the appropriations which have been made in recent years.

Hydrographic Survey.

In preparing the plans for Barge canal work, particularly in determining upon the sources of water supply and the storage facilities the records obtained as a result of the co-operative hydrographic survey by the State of New York and the Federal government, have been of material value. The amount appropriated by the State for this co-operative hydrographic survey during recent years has been $1,500 annually. The information obtained from such co-operative work was not sufficient to supply the needs of this department in considering the design for the Barge canal and it was therefore necessary to establish a bureau of hydraulics, which bureau had supervision over the gaging of streams tributary to the Barge canal. The records obtained as a result of the co-operative hydrographic survey and the establishment of the bureau of hydraulics in this department are of value not only to this department but to various other State departments, the State Conservation Commission and also to municipalities and to companies or individuals interested in water supply or in the development of power along the streams of the State. I therefore recommend that the usual appropriation of $1,500 be made by the Legislature in order to continue the co-operative hydrographic survey of the State.

Surveys for State Departments and Commissions.

During the year surveys and investigations have been made at different localities for various State departments or commissions, some of these covering considerable area and requiring the employment of employees of this department for various periods of time. The custom for years has been that the State Engineer has made such surveys, being reimbursed by the department or commission for whom the same were made upon the completion of the work embraced therein. There is no objection to the State Engineer making such surveys and investigations, and in fact the State Engineer should, I believe, make all surveys for the various State departments or commissions not having directly under their control an engineering bureau. The principal difficulty encountered in this arrangement has been in the financing of the various survey parties. It has been necessary for the State Engineer to advance money in order to defray the expenses incurred and for the salaries of the employees of the department, inasmuch as the department or commission for which the survey is made often has not available funds which may be drawn upon to defray such expenses at the time of the making of the survey. In order to remedy this condition, there should be granted to the State Comptroller a loan fund of at least $5,000 upon which the State Engineer might draw drafts to be used temporarily for the payment of such engineering expenses, the amount of such drafts to be refunded by the department or commission upon the completion of the work and when funds under the direction of such department or commission are made available.

Black River Survey.

Chapter 190 of the Laws of 1911, directed the State Engineer to make a survey and prepare plans and estimates for improving the Black river for navigation between the State dam at Carthage and Sacketts Harbor on Lake Ontario. At the present time that portion of the Black river lying between Carthage and Lyons Falls is a part of the canal system of the State, known as the Black River improvement. This section was improved for navigation between the years 1854 and 1861. On account of the dilapidated condition of the lock into the river at Lyons Falls there has been no communication between the Black River canal and the river for navigation for several years.

In accordance with the provisions of the above mentioned statute, I have had in the field a survey party during the past year engaged in investigating, and making surveys of several possible routes for improving the Black river for navigation between Carthage and Sacketts Harbor, termini specified in the law. Between Carthage and Watertown it appears to be practicable to canalize the Black river following very closely the thread of the stream with a few deviations from the same. Below Watertown the character of the river is such as to make it necessary to select a new location, and accordingly surveys of the various possible routes have been made. A careful investigation has been and is now being carried on in order to determine upon adequate and available sources of water supply. There is appended a report of the Division Engineer showing in detail the work which has been accomplished to the end of the current year. This work is rapidly nearing completion and when the same shall have been completed a final report will be made to the Legislature.

Fireproof Depositories for State Records.

During the past year the State learned a lesson of the folly of neglecting to provide satisfactory fireproof vaults in which to place its valuable and irrecoverable records. In the custody of the State Engineer there are innumerable records of inestimable value, not only to the State authorities but to the individuals who have occasion to consult the same; the majority of these records cannot be replaced if once destroyed. The catalog recently published, giving a list of maps and papers filed in the Land Bureau of the State Engineer's Department gives an idea of the value of the records of but one bureau of this department.

In 1910 the Legislature made provision by a small appropriation for the necessary repairs and the installation of fireproof vaults in the office building used by the State Engineer's Department and the department of Public Works at Syracuse. Such action will provide for the protection of the records in the Division office at Syracuse, but there are still in the office of the Division Engineer of the Western Division at Rochester, and in the Eastern Division office at Albany and the State Engineer's office at Albany many records which should be placed in suitable fireproof vaults. It would be

folly to wait for the relocating of the State Engineer's office in some other building according to a tentative plan recently advocated before providing suitable fireproof vaults for the records of this department.

The destruction of the State library while the new Educational building was in process of construction particularly emphasizes this point. I therefore recommend that provision be made at the earliest possible date for providing suitable fireproof depositories for the records in the Division Engineers' offices at Albany and Rochester and for the records and valuable papers in the office of the State Engineer at Albany.

Bridge Over the Mohawk River.

In canalizing the Mohawk river between Cohoes and Schenectady, two highway bridges existing at present and adjacent to aqueducts carrying the present canal across the river, will require extensive modifications in order to meet the Barge canal requirements. Present indications are that the owners of these bridges will not expend funds necessary in order to so modify these structures as to meet Barge canal requirements, but will allow them to be removed. There will then be no means for highway traffic to cross the Barge canal within this distance of 19 miles between Schenectady and Cohoes. It therefore seems to me proper for the State to construct a bridge at some point between Cohoes and Schenectady as will best meet the demands of highway traffic in this vicinity. I therefore recommend that an appropriation be made for the construction of such a bridge over the Barge canal at some point between Cohoes and Schenectady.

Dam at Cohoes.

Below the point where the present Champlain canal crosses the Mohawk river in the vicinity of Cohoes there exists a State dam which constitutes a part of the present canal system. On account of the location of this dam and the natural topography, there are certain rapids immediately below the dam, and the ice passing over the crest of the dam in the spring floods falls directly upon the toe and apron of this dam. On account of such condition

this structure has been damaged each year and repairs made from time to time. The last repairs to this dam were made in 1904 and the structure is now in a dilapidated condition. It seems inadvisable to again attempt to make repairs to the old structure and, accordingly, I recommend that provision be made for the construction of a new dam at this point.

Pollution of the Waters of the Barge Canal System.

Realizing the importance of preventing the pollution of the waters of the State canal system and the necessity for protecting the health of the citizens of the State, I have recently taken up with the Governor of the State and with the State Department of Health the question of providing adequate sewage disposal plants for the municipalities along the canal system. The State Department of Health has advised that the present public health statutes are inadequate to correct the existing conditions; that prior to 1903 the State Department of Health had no power to enjoin or remove sewage pollution from any State waters. In 1903 an act was passed which, while providing a remedy against future pollution, specifically exempted municipalities and industrial plants discharging sewage and waste into the waters of the State at the time of such enactment. In 1910 a further enactment was made to the Public Health Law investing the Department of Health with further powers, which, however, fail in effective purpose on account of the limitations to cases of pollution in which, after full investigation and report, there is established a public nuisance or menace to health.

In view of the inadequate statutes at the present time and on account of the approaching completion of the Barge canal, legislation should be enacted without delay in order to remedy the existing conditions. In order to allow for the installation of sewage disposal plants before the opening of navigation statutes must be enacted at once, the precise form of such legislation to be along such lines as may be determined by future conference between the Superintendent of Public Works, the State Engineer and Surveyor and the Department of Health.

Map of Canals.

Accompanying my report there is a map showing the canals of the State. Unlike canal maps of former years, its extent includes the whole State, since now the terminals to be built throughout the State become a part of the canal system. Its scope also has been extended, so that it includes canals once in existence but now abandoned, as well as present canals and the improvements now in progress. In addition the system of State reservoirs is shown. To avoid confusion, little besides the canals and reservoirs is given, except the natural water courses, and these are shown with some completeness.

Canal Terminals.

At the recent November election the people of the State approved of the referendum providing for the issuing of bonds in order to provide funds for the construction of suitable terminals for the Barge canal system. Immediately upon learning of the result of the vote of the people which was not until the official canvass on December 13, I appointed a terminal engineer to take charge of this work as a whole, and have appointed engineers to take up the work of investigating the terminal questions at New York and Buffalo. It is my purpose to establish offices in the principal cities where terminals are to be built in order to progress this work as rapidly as possible. The preparation of plans and the construction of terminals for the canal system, which is a matter of great importance, seems to have been delayed by the State authorities in the past. It is planned to hold conferences in the different localities in order to ascertain accurate information relative to the nature of the traffic that may be expected on the canal system and thereby provide adequate terminal facilities. In New York city, fortunately, similar work has been carried on to such an extent that many standards have been fixed. The many miles of sea wall and the well known group of docks, the Chelsea improvement, recently built under the direction of the Commissioner of Docks and Ferries, will furnish not only examples but standardized plans which will save considerable time in designing. At all terminals particular attention will be given to freight handling devices, to the end that the Barge canal termi-

nals may excel in this particular and fix the conditions that they may meet.

Comparison Between Barge Canal and Panama Canal.

Attention is frequently called to the progress being made in the construction of the Panama canal under the direction of the Federal government. The Barge canal being constructed by the State of New York is not so widely known throughout the country, and a few comparisons relative to the work of those two undertakings is both interesting and instructive.

The Panama canal is 50 miles in length; the Barge canal, including navigable lakes, 530 miles in length. The estimated cost of the Panama canal is $375,000,000. The estimated cost of the Barge canal is $108,000,000, but these estimates of cost are not indicative of the amount of work being done. On account of the large amount of excavation necessary at the Culebra cut in the Panama canal, the total excavation is much greater than for the Barge canal, being 175,000,000 cubic yards as compared with 110,000,000 cubic yards, but it is of interest to note that the preliminary estimate for the Barge canal excavation exceeded the estimate for excavation for the Panama canal by approximately 7,000,000 cubic yards. Concrete to the amount of 5,000,000 cubic yards will be used in the Panama canal construction, and approximately 3,000,000 cubic yards on Barge canal construction.

At Panama the concrete is placed chiefly in the six pairs of locks, while in the Barge canal construction, the number of structures greatly exceeds the small number at Panama. There will be 57 standard locks on the Barge canal and several smaller ones. Thirty dams will be built and several remodeled. The bridges to be constructed will number nearly 200, making the total number of structures to be erected in the Barge canal improvement between 350 and 400.

Comparisons are not altogether possible where conditions are variable, but taking into consideration the length of the canal, the number of structures, the alignment through a well developed country and the necessity for maintaining navigation, together with the difficulties encountered through cities in the construction of the Barge canal, the people of the State have some reason for satisfaction in their unaided accomplishment in canal construction.

State Fair Exhibit.

For the State Fair of 1911 the Legislature made a small appropriation in order to enable various State departments to prepare exhibits and in response to the request of the State Fair Commission the State Engineer's Department prepared an exhibit showing the various phases of the Barge canal improvement. Models were exhibited showing the great variety of typical sections of the canal prisms and the different structures being erected and a model of one of the locks workable as a whole was in operation to show the method of lockage of canal boats. By the use of motion pictures and a map prepared giving a bird's-eye view of the canal system throughout the State the people were given an idea of the nature of the work now in progress.

Charting of New York's Navigable Waters.

During the year I have co-operated with the United States Department of War for the charting of the navigable waters of New York State. The last Sundry Civil Act extended the lakes survey to include these waters and from the carrying out of this provision, in which I have co-operated, there will result charts for the State canal system which are similar to the standard charts of the United States and Canada.

Appended Reports.

Engineering Expenses: Contract Work.

Appended to my report there will be found, first tables giving summaries of the engineering expenses of the department for the fiscal year, followed by other tables showing the construction contracts completed during the year and also those in force at its close. The details of the expense tables are contained in the reports of the three Division Engineers.

Division Engineers.

The canal is divided into three divisions and the work in each division is in charge of a Division Engineer. The three Division Engineers have made reports of the year's work in their respective divisions. In these are contained the reports of the Resident Engineers, which describe in detail what has been accomplished in the way of construction on the Barge canal.

Testing Laboratory for State Works.

For many years the State Engineer's Department has included a testing laboratory where are made tests of all hydraulic cement used for State work, not only for the numerous works which are under the direction of the State Engineer, but also for those supervised by the State Architect, in the many buildings which he constructs. The character and importance of the work being done on the Barge canal has also necessitated the testing of sand submitted for use in the large concrete structures. The testing of cement for State highway improvement is still carried on in this laboratory, though at the expense of the Highway Department.

The methods of cement testing are in accord with the latest and best practice. The high grade of requirements has been maintained during the year, thus keeping up with the improved methods and products of American manufacturers of Portland cement.

Cement proposed for use in large quantities on the Barge canal is now generally inspected at the mill and this has become an important branch of the work of the laboratory.

The detailed account of the year's work will be found in the appended report of the Resident Engineer in charge of the laboratory.

Land Bureau.

The Land Bureau of the State Engineer's Department has charge of the sale of State land and of the custody and care of ancient records. The ancient records on file in this department, as well as the modern ones, are of great value for reference, and it has been the policy in recent years to add to them whenever this can be done without cost to the State.

Because the State Engineer is one of the Commissioners of the Land Office and maintains the Land Bureau in connection with this membership, the commissioners generally refer matters calling for the making of examinations of maps. For this purpose a small fund is needed and therefore I recommend the appropriation of $1,000.

Many of the ancient maps and records are so old and are referred to so often that they are fast being destroyed. They are too valuable to be thus lost, and, accordingly, I recommend the

appropriation of $1,000 for publishing copies of some of them, which will both save the originals and permit a wider use of the information they contain.

The detailed report of the engineer in charge of the Land Bureau will be found appended to this report.

Bureau of Hydraulics.

Since the beginning of co-operative stream gagings by the State and the United States, it has been customary to publish the results of these gagings as a part of the State Engineer's annual report. These records are valuable and, as time goes on and their field becomes longer, they will grow more valuable. Several times this report has been published in a supplemental volume, and this plan will be followed in the present instance, since it is much more convenient and accords with general practice to publish the data by calendar years, and the amount of work in compiling, computing and publishing the tables after the close of the year is such as to delay the printing of the remainder of the report.

In 1906 a bureau of hydraulics was established in the Barge canal office. Besides studying the general problems in relation to the hydraulics and hydrology of the rivers and canals, arising in connection with the design and construction of the canal, and the preparation of the technical defense for the State in claims arising from the appropriation of water power, from backwater caused by Barge canal dams, and in other hydraulic claims, this bureau maintains gaging stations to determine water levels and measure the flow of streams.

Data acquired in this latter work constitutes the published report. These gagings are supplemented by those derived from the co-operative survey, and through the courtesy of the State Conservation Commission, the Board of Water Supply of the City of New York and various corporations and individuals, others are added, so that the whole report becomes complete.

Respectfully submitted,

J. A. BENSEL,

State Engineer and Surveyor.

Total Amount of All Kinds of Construction Work to January 1, 1912.

Similar kinds of work are grouped under one heading; an enumeration of the items grouped is shown in the foot-note.

Contract Number.	Excavation.a	Embankment.b	Concrete.c	Dry stone work.d	Sawed lumber.e	Round timber.	Foundation piles.	Iron and steel.f	Iron and steel.g	Miscellaneous items of work.h	Miscellaneous construction items.i	Extra and unspecified work.j
	Cu. yds.	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*	*Ft. B. M.*	*Lin. ft.*	*Number.*	*Lbs.*				
1	705,669	24,657	4,608	13,589	85,724	65,343	270	308	0	$288	0	$7,834
2	426,125	58,420	82,910	0	26,440	0	22,350	375,792	$1,626	28,156	$3,368	35,942
2-E	111,729	53,267	21,510	3,536	112,440	28,460	21,945	46,138	1,522	703	11,514	6,755
3	829,101	117,298	34,262	29,212	54,715	0	300	184,513	0	6,338	1,195	54,839
4	2,844,909	113,441	10,974	56,042	1,150,717	534,203	42,052	214,346	495	35,622	1,968	12,584
4-B	350	350	92	34	1,891	0	0	818	0	0	150	0
5	901,601	10,649	1,770	518	56,457	0	497	0	0	2,862	153	0
6	2,086,051	35,584	4,112	10,292	0	0	0	0	0	700	25,944	766
7	0	0	111	10	139,617	0	0	1,859,128	0	1,000	4,611	3,244
8	243,303	38,458	64,916	13,568	439,660	0	367,481	2,054,061	74,167	702	13,447	356
9	552,370	365,318	9,881	63,604	106,760	0	2,434	1,745,044	4,600	12,836	10,987	3,594
10	331,845	26,335	49,490	4,933	94,428	0	0	403,227	7,987	2,377	16,848	2,019
10-A	0	0	0	0	0	0	0	0	0	0	0	0
11	671,953	279,995	147,559	2,245	256,526	0	6,285	862,139	0	1,336	9,214	2,398
12	4,677,305	50,506	10,707	650	64,090	0	2,246	623,835	189	8,347	1,359	329
13	0	0	0	2	8,760	0	0	432,756	0	0	2,872	0
14	618,911	155,029	200,140	36,466	695,030	0	49,354	3,120,126	168,944	70	8,254	24,673
14-R	0	0	0	0	0	0	0	0	0	0	458	0
15	2,677,667	98,740	56,669	34,050	304,219	0	101,943	1,423,073	52,400	300	8,559	5,641
16	0	0	2	9,267	0	0	0	163,127	0	0	4	0
17	146,746	23,022	48,593	23,016	222,869	0	1,768	2,900,294	126,221	200	4,662	1,835
18	456,609	222,540	25,845	2,144	139,205	0	5,244	83,828	30,327	3,367	2,959	19,606
19	2,733,206	26,501	13,352	1,455	1,097,119	20,285	1,970	286,697	0	3,433	459	4,883
20-A	222,170	2,125	0	0	0	0	0	0	0	0	0	200
20-B	397,062	0	0	1,081	0	0	0	0	0	74	2,435	0
20-C	763,744	0	0	741	0	0	0	0	0	144	1,991	0
20-D	165,740	0	28	0	0	0	0	0	0	58	0	0
21	1,107,505	0	986	0	0	0	0	3,863	0	2,840	5,439	0
22	15,250	11,531	562	135	0	0	1,714	22,945	0	990	1,995	0
23	1,560,998	662,857	48,763	887	5,874	0	1,313	668,117	1,157	5,437	4,152	0
24	3,096	431	0	0	0	0	0	0	0	0	0	0
25	4,889,057	94,945	26,105	45,994	1,215,322	0	51,421	147,345	394	1,750	1,809	1,325
26	94,456	0	0	0	0	0	0	0	0	10	0	0
27	920,187	30,514	18,866	0	84,819	0	6,760	82,820	0	1,189	125	14,885
27-A	106,716	39,235	5,665	4,799	8,671	0	8,315	27,315	0	445	40	0
29	789,202	229,226	22,259	1,103	613,400	712	7,553	337,621	8,224	5,715	2,782	5,535
30	2,386,431	144,971	24,043	7,697	8,468	0	0	64,357	4,222	7,579	6,463	0
31	193,286	7,574	51,317	12,210	59,795	2,598	0	281,390	81,179	7,770	5,144	626

32	0	0	1	0	59,944	0	0	39,980	0	0	0	0
33	0	0	46	0	112,827	0	0	747	153,994	0	0	1,699
34	0	0	195	3	0	0	0	377,532	0	0	3,893	59
35	117,612	2,964	43,818	5	32,247	0	0	504,746	24,149	436	3,190	911
36	0	0	0	0	0	0	0	0	23,400	0	0	0
37	550,740	1,197	184	0	1,400	0	0	0	0	678	0	0
38	12,835	0	315	846	1,986	0	0	111,433	0	200	1,308	348
39	176,202	0	0	0	0	0	0	0	0	0	0	0
40	1,621,177	5,627	4,567	15,573	27,392	0	378	27,777	0	12,000	37,797	95
41	909,620	647,096	204	546	0	0	0	0	0	1,250	404	97
42	1,861,858	277,371	3,618	242	521,421	0	31,636	342,346	0	613	2,443	0
43	530,419	0	3,274	0	124,066	0	12,347	410,778	0	152	0	0
44	1,609,546	77,037	28,219	86	1,264,710	7,932	30,137	315,711	373	12,578	76,708	0
45	258,373	34,021	30,781	3,277	110,908	0	1,272	325,671	30,989	38,205	70,871	867
46	3,811,766	2,180	3,131	1,004	174,155	0	20,388	1,402	64	7,440	0	0
47	3,156,034	12,927	18,039	11	35,500	0	5,755	170,816	768	17,180	8,934	0
48	377,153	70,122	7,558	702	44,000	0	5,452	16,829	3	1,730	20,231	2,179
49	739,839	4,518	15,675	8,593	1,504,000	0	8,326	241,246	145	8,038	788	0
50	44,405	47,826	14,618	0	168,928	0	0	208,761	0	2,798	0	0
51	159,564	4,262	675	387	4,270	0	340	3,010	0	900	300	0
53	56,689	10,145	15,333	68	18,455	586	0	37,782	16,126	3,260	827	1,113
54	16,127	8,326	7,249	0	189,083	0	26,848	8,871	171	11,166	47	0
55	335,138	113,069	96,877	1,254	73,584	417	783	656,866	12,304	8,640	11,927	405
55-R	0	0	0	0	0	0	0	0	0	0	5,631	0
60	1,120,925	745,703	17,201	76,930	109,539	0	5,176	1,548,657	3,070	34,035	20,532	26,841
61	667,497	417,009	10,609	25,528	37,939	0	1,606	385,422	750	21,200	3,771	102
62	781,829	315,462	16,942	10,338	46,417	466	620	1,249,100	7,205	29,309	3,910	1,715
63	1,224,014	179,826	30,989	17,614	62,586	0	681	1,533,732	975	22,050	16,386	147,242
64	554,732	327,989	18,431	23,904	59,264	0	2,300	2,116,398	1,750	29,075	10,854	108
66	567,874	248,015	15,635	46,386	77,351	0	3,522	1,119,369	825	21,880	9,931	4,386
67	147,883	19	12,949	55	12,235	129	0	526,547	4,455	9,792	11,598	7,543
68	554,759	59,401	61,808	6,798	100,155	2,984	0	294,155	69,174	24,050	4,587	1,645
69	59,418	0	17,939	0	3,140	423	0	151,791	3,162	6,625	506	0
70	237,321	0	0	0	0	0	0	0	0	1,300	0	0
71	368,513	0	10,847	0	0	0	0	16,500	235	5,678	300	4,345
72	498,830	0	0	0	0	0	0	0	0	360	0	0
73	960,889	9,168	2,020	0	8,618	68	0	2,325	0	3,015	174	0
75	0	0	0	0	0	0	0	0	0	0	0	0
76	731,176	88,223	17,130	0	418,000	0	0	38,440	4,550	4,080	54	1,650
77	1,071,023	30,911	28,765	0	204,988	0	7,867	156,324	922	7,300	0	365
78	105,030	92,158	40	5,478	0	0	0	696	0	0	1,828	51
79	802	0	935	0	0	0	0	413,724	0	2,600	1,913	0
80	4,787	0	5,865	0	3,910	0	0	15,600	19,246	20,350	0	209
82	0	0	0	0	5,045	0	0	316,196	0	0	2,849	0
85	760	171	115	37	0	0	0	1,067	0	240	0	0
86	738	455	0	0	12,039	0	50	2,068	0	525	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0
90	136	102	415	0	0	0	0	377,057	103,291	25	18,665	0
91	1,388	0	407	0	0	0	0	1,178	0	975	0	0
Total	60,635,771	6,774,819	1,549,514	615,680	12,692,385	664,606	868,699	32,483,673	$1,045,750	$514,366	$514,517	$413,844

Total Amount of All Kinds of Construction Work to January 1, 1912 —(*Continued*).

Contract Number.	Excavation.*a*	Embankment.*b*	Concrete.*c*	Dry stone work.*d*	Sawed lumber.*e*	Round timber.	Foundation piles.	Iron and steel.*f*	Iron and steel.*g*	Miscellaneous items of work.*h*	Miscellaneous construction items.*i*	Extra and unspecified work.*j*
	Cu. yds.	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*	*Ft. B. M.*	*Lin. ft.*	*Number.*	*Lbs.*				
A	24,529	0	6,942	0	131,925	0	0	12,684	$397	$1,452	$36,569	0
B	2,113,715	0	0	0	0	0	0	0	0	105	0	0
H	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,138,244	0	6,942	0	131,925	0	0	12,684	397	1,557	36,569	
Grand total	62,774,015	6,774,819	1,556,456	615,680	12,824,310	664,606	868,099	32,496,357	$1,046,147	$515,923	$551,086	$413,844

a Includes earth and rock excavation and grubbing. *b* Includes embankment and puddle. *c* Includes concrete (all classes) and grouted filling. *d* Includes ballast, dry retaining wall, wash-wall, lining, riprap and stone filling in cribs. *e* Includes sawed lumber (all kinds), wooden sheet-piling and sheeting and bracing. *f* Includes chains, iron castings (plain or machined) iron pipe and specials, metal reinforcement, steel and iron fastenings, steel castings, structural steel and wrought iron. *g* Includes items usually paid for by the piece — fender fastenings, gate-hoists, lock-gates, needle-dams, traveling cranes, lamp poles, valve operating machinery, valves, valve-seats and valve-supports. *h* Includes bailing and draining, clearing, extra labor on forms and finishing concrete, removing concrete, dressing concrete, maintaining traffic, overhaul, removing revetment and removing existing structures. *i* Includes channeling, cut stone work, iron railings, paving (all kinds), expanded metal, raising bridge superstructures, repairs to local sewers, etc., sidewalks and curbs, steel sheet-piling, trenching and backfilling, vitrified pipe, wooden fencing, drilling bolt holes and constructing office buildings. *j* Extra work orders.

Bids for Contract No. 5-A.

ITEMS.	Measure.	Quantities.	Engineer's Estimate.		James Stewart & Co., 30 Church St., New York, N. Y.		The T. A. Gillespie Co., 50 Church St., New York, N. Y.		Joseph E. Stabell, 1176 Niagara St., Buffalo, N. Y.		E. M. Graves, Cleveland, O.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.
Excavation	cu. yd	202,300	$1 75	$354,025	$1 35	$273,105	$1 44	$291,312	$1 61	$325,703	$1 39	$281,197
Sheeting and bracing	M. ft. B. M.	3.2	60 00	192	60 00	192	60 00	192	60 00	192	60 00	192
Forming embankment	cu. yd	7,900	25	1,975	27	2,133	25	1,975	30	2,370	25	1,975
Lining	" "	240	2 00	480	2 00	480	2 00	480	2 40	576	2 00	480
Sawed lumber, hemlock	M. ft. B. M.	61	50 00	3,050	55 00	3,355	50 00	3,050	55 00	3,355	50 00	3,050
Round timber in cribs	lin. ft.	6,400	20	1,280	20	1,280	20	1,280	24	1,536	20	1,280
Stone filling in cribs	cu. yd	900	3 00	2,700	3 25	2,925	3 00	2,700	3 50	3,150	3 00	2,700
Foundation piles	lin. ft.	5,900	30	1,770	30	1,770	30	1,770	35	2,065	30	1,770
Wooden sheet-piling	M. ft. B. M.	5	60 00	300	60 00	300	60 00	300	65 00	325	60 00	300
Steel sheet-piling	sq. ft.	4,700	1 25	5,875	1 35	6,345	1 25	5,875	1 50	7,050	1 25	5,875
Second-class concrete	cu. yd	1,380	9 00	12,420	9 90	13,662	9 00	12,420	10 00	13,800	9 00	12,420
First-class masonry, bridge coping	" "	1.4	20 00	28	20 00	28	20 00	28	20 00	28	20 00	28
Third-class riprap	" "	1,940	3 00	5,820	3 30	6,402	3 00	5,820	3 50	6,790	3 00	5,820
Wooden fence	lin. ft.	1,480	25	370	25	370	25	370	30	444	25	370
Maintaining traffic	lump sum	.....	500 00	500	550 00	550	500 00	500	600 00	600	500 00	500
Coffer-dams, pumping, bailing and draining	" "	.....	2,000 00	2,000	2,200 00	2,200	2,000 00	2,000	2,400 00	2,400	2,000 00	2,000
Supporting highway bridge	" "	.....	2,500 00	2,500	2,500 00	2,500	2,500 00	2,500	3,000 00	3,000	2,500 00	2,500
Total				$395,285		$317,597		$332,572		$373,384		$322,457

APR 5 1912

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MARCH, 1912

Barge Canal Bulletin

Series V No. 3

DEPARTMENT OF

THE STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
ALEXANDER E. KASTL, Special Deputy State Engineer

ISSUED MONTHLY UNDER THE AUTHORITY OF THE STATE ENGINEER, BY THE BUREAU OF PUBLICATION AND REPORTS, DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR

CONTENTS

Progress of Contract Work..... 83
Brief Account of Contract Work for February..... 84
Progress of Plans Being Prepared..... 100
Contract Advertised..... 102
Award of Contracts..... 103
Bids for Contract No. 10-B..... 104

ENGINEERING DEPARTMENT—Barge Canal.

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Special Deputy State Engineer.

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Supervising Engineer.

W. H. YATES,
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BUREAUS:

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G. F. STICKNEY, Supervising Engineer.

Bridges, Metalic Structures and Electrical Equipment,
W. H. YATES, Supervising Engineer,
WM. R. DAVIS, Chief Bridge Designer.
C. C. EGBERT, Expert in Electrical Design.

Other Bureaus,
H. D. ALEXANDER, Spec. Res. Engineer.

Hydraulics,
JOHN P. NEWTON, Assistant Engineer.

Computing and Checking,
F. M. EAMES, Assistant Engineer.

Publication and Reports,
NOBLE E. WHITFORD, Resident Engineer.
Also Editor of *Barge Canal Bulletin*.

Testing Laboratory,
R. S. GREENMAN, Resident Engineer.

CONSTRUCTION RESIDENCIES:

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G. W. STICKNEY, Assistant Engineer.

Erie, Residency No. 2,
S. W. BELDING, Resident Engineer.

Mohawk River Residency,
E. A. LAMB, Resident Engineer.

Erie, Residency No. 3,
E. D. HENDRICKS, Resident Engineer.

Erie, Residency No. 4,
PHILIP H. DATER, Resident Engineer.

Erie, Residency No. 4-A,
EARLE TALBOT, Resident Engineer.

Erie, Residency No. 5,
D. B. DONOVAN, Resident Engineer.

Erie, Residency No. 6,
D. C. WEDGEWORTH, Resident Engineer.

Erie, Residency No. 7,
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Erie, Residency No. 10-A,
J. V. HOGAN, Assistant Engineer.

Erie, Residencies Nos. 10-B and 11,
EDWARD ANDERBERG, Assistant Engineer.

Champlain, Residency No. 1,
F. P. WILLIAMS, Resident Engineer.

Champlain, Residencies Nos. 2 and 3,
E. V. R. PAYNE, Resident Engineer.

Oswego, Residency No. 1,
THERON M. RIPLEY, Resident Engineer.

Oswego, Residency No. 2,
JAMES BURDEN, Resident Engineer.

Cayuga and Seneca Residency,
L. S. HULBURD, Resident Engineer.

Cayuga and Seneca Residency,
A. E. STEERE, Resident Engineer.

Water-Supply Residency,
L. C. HULBURD, Resident Engineer.

TERMINAL DIVISION ENGINEERS:

CARLETON GREENE,
Southern Division Engineer.

GUY L. NOBLE,
Middle Division Engineer.

Progress of Contract Work.

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Mar. 1, 1912.
		Put under contract.*	Done to Mar. 1, 1912.	Done during Feb., 1912.	
1	Empire Engineering Corporation	$580,424	$474,400	0	81.8
2	Ferguson Contracting Co. *a*	968,512	694,390	0	73.0
2E	Holler & Shepard *b*	(283,890)	251,130	0	88.6
3	Sundstrom & Stratton	657,273	633,290	0	Finished.
4	Empire Engineering Corporation	726,780	720,073	0	Finished.
4B	E. J. Doyle & Company	1,351	1,332	0	Finished.
5	Empire Engineering Corporation *a*	156,941	125,820	0	80.2
5A	James Stewart & Company *b*	(317,597)	0	0	0.0
6	F. A. Maselli	1,026,550	1,033,864	0	Finished.
7	Groton Bridge Company	101,930	98,929	0	Finished.
8	Pittsburg-Eastern Company *a*	1,516,789	920,420	0	60.7
9	Thomas Crimmins Contracting Co.	803,297	655,461	0	Finished.
10	McDermott Contracting Company *a*	1,111,965	668,360	0	60.1
10A	The T. A. Gillespie Company *b*	(106,738)	3,670	$2,550	3.4
11	Fort Orange Construction Company	1,352,999	1,154,410	0	85.4
12	James Stewart & Company	3,555,467	2,366,560	0	66.6
13	Penn Bridge Company	28,126	20,180	0	71.7
14	Acme Engineering & Contracting Co.	2,985,225	2,456,290	13,220	82.2
14R	Thomas F. Riley	724	470	0	65.0
15	Atlantic, Gulf & Pacific Co.	1,481,692	1,378,956	15,326	Finished.
16	United Construction Company	78,715	24,490	8,110	31.1
17	The Scofield Company *a*	842,418	57,560	0	6.9
17	Alexander Murdoch *b*	(812,286)	743,610	0	91.5
18	Kelley Bros. Contracting Company	611,382	476,979	0	Finished.
19	Great Lakes Construction Company	891,401	715,470	2,990	80.3
20A	Houston Barnard	490,592	190,680	3,630	38.8
20B	S. Pearson & Son, Inc.	933,194	258,960	0	27.7
20C	American Pipe & Construction Co.	585,720	395,890	0	67.6
20D	American Pipe & Construction Co.	2,685,477	84,920	0	3.2
21	Lane Brothers Company	1,323,150	561,800	1,250	42.4
22	M. Fitzgerald	117,194	23,860	3,340	20.4
23	Millard & Lupton Company	1,808,797	839,140	4,060	46.4
24	James D. Sherrill	44,368	5,840	2,480	13.2
25	Atlantic, Gulf & Pacific Company	1,694,037	1,440,750	2,680	85.1
26	Lake Erie Dredging Company	40,057	35,443	0	Finished.
27	Kinser Construction Company *a*	723,269	378,650	0	Finished.
27A	Holler & Shepard *b*	(449,562)	120,130	10,480	26.7
29	Maryland Dredging & Contr'g Co.	674,250	405,680	0	60.2
30	Acme Engr'g & Contracting Co.	2,558,955	1,034,030	1,180	40.5
31	Casey & Murray	831,302	688,160	6,110	82.8
32	Penn Bridge Company	46,797	44,375	0	Finished.
33	Penn Bridge Company	199,640	164,550	0	82.5
34	M. Fitzgerald	22,449	22,258	0	Finished.
35	Gilmour-Horton-Allen Company	748,045	509,610	0	68.1
36	J. D. Miller	46,800	46,800	17,550	100.0
37	Henry P. Burgard	2,357,088	960,770	0	40.8
38	Henry Tosh & Son	16,870	16,287	0	Finished.
39	James Stewart & Company	1,048,674	146,240	0	14.0
40	United Engr'g & Contracting Co.	2,252,144	1,531,270	72,590	68.0
41	Butler Bros. Construction Company	273,238	241,644	0	Finished.
42	Shanley-Morrissey, Inc.	1,047,366	475,740	6,170	45.4
43	M. A. Talbott Company	1,365,876	164,460	7,750	12.0
44	Scott Brothers	1,758,068	711,160	8,290	40.4
45	Scott Brothers	472,802	418,652	0	Finished.
46	Kinser Construction Company	1,291,805	693,160	60	53.7
47	Crowell-Sherman-Stalter Company	1,279,328	790,740	7,630	61.8
48	Crowell-Sherman-Stalter Company	1,670,695	335,490	23,060	20.1
49	American Pipe & Construction Co.	722,770	373,280	3,900	51.7
50	Buffalo Dredging Company	964,884	123,210	0	12.8
51	Alto Construction Company	389,842	89,650	2,420	23.1
53	Scott Brothers	167,585	164,576	0	Finished.
54	Hunkin-Conkey Construction Co.	250,590	91,200	3,020	36.4
55	Arthur McMullen	945,840	861,340	0	91.0
55R	Joseph Kalk & Alfred S. Brown	7,561	5,630	0	74.4
60	Empire Engineering Corporation	1,491,317	1,226,810	7,860	82.3
61	Cleveland & Sons Company	1,088,890	666,530	14,770	61.2
62	I. M. Lucington & Sons, Inc.	2,373,126	993,720	93,140	41.8
63	H. S. Kerbaugh, Inc.	2,328,935	930,290	65,370	39.9
64	Empire Engineering Corporation	1,335,434	737,690	2,810	55.2
66	Empire Engineering Corporation	829,284	679,880	7,150	82.0

Progress of Contract Work—(*Continued*).

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Mar. 1, 1912.
		Put under contract.*	Done to Mar. 1, 1912.	Done during Feb., 1912.	
67	Larkin & Sangster	$1,149,401	$459,940	$53,940	40.0
68	Shanley-Morrissey, Inc	1,042,736	945,490	0	90.7
69	I. A. Hodge & Company	240,061	185,870	3,790	77.5
70	Shanley-Morrissey, Inc	779,636	236,240	0	30.3
71	Shanley-Morrissey, Inc	1,561,119	821,960	5,830	52.7
72	Shanley-Morrissey, Inc	1,202,658	618,900	0	52.3
73	E. M. Graves	518,829	517,223	0	Finished.
75	United Construction Company	42,917	13,090	13,090	30.5
76	The T. A. Gillespie Company	1,512,011	618,690	31,890	40.9
77	The T. A. Gillespie Company	1,669,640	741,360	32,810	44.4
78	Cunningham-Woodard Company	49,026	47,290	0	Finished.
79	Lupfer & Remick	37,480	33,730	0	Finished.
80	Walter Bradley	117,391	108,130	420	92.1
82	Groton Bridge Company	28,841	21,200	1,590	73.5
85	Lupfer & Remick	13,238	1,930	0	14.6
86	Lathrop, Shea & Henwood Co	43,440	4,940	0	11.3
88	Lathrop, Shea & Henwood Co	25,658	0	0	0.0
90	D'Olier Engineering Company	180,318	157,660	4,450	87.5
91	The Hollington Company	42,940	6,740	0	15.7
	Totals	$73,041,406	$41,898,042	$568,756	

Cayuga and Seneca Canal.†

A	Scott Brothers	$357,627	$120,910	$2,610	33.8
B	Crowell-Sherman-Stalter Co	1,436,597	466,570	0	32.5
H	James H. Dawes	179,769	0	0	0.0
	Totals	$1,973,993	$587,480	$2,610	

* Includes all alterations in force to date. *a* Suspended by order of the Canal Board. *b* Relet to complete former contracts, contract price not included in total. † Authorized by separate appropriation. *c* Decrease, due to recomputation for final account.

Brief Account of Contract Work for February.

The following pages show what has been done during the month on the several contracts now in force on the Barge canal. The Erie canal contracts are described in order from Waterford west to Buffalo, and the Champlain and Oswego canal contracts follow, in order from south to north, while the Cayuga and Seneca canal contracts are given from east to west.

Erie Canal.

Contract No. 33.— Lock-gates and valves, guard-gates, etc., on Contracts Nos. 2, 10, 11 and 15.

The work on this contract is substantially completed, except at Lock No. 3, on Contract No. 10-B, recently awarded.

Contract No. 16.— For eleven steel highway bridges, ten of which are at various points on Contracts Nos. 25 and 27, Champlain canal, and the remaining one on Contract No. 11, Erie canal.

At Fort Ann bridge, about 80 tons of structural steel were received and about the same amount erected and riveted in place. Supplies were hauled and some plant removed to Comstock.

At Brayton's bridge, riveting was completed and plant moved to Fort Ann. About 14,239 ft. B. M. of yellow pine flooring were placed.

At Comstock bridge, material was delivered at site and erection of plant and false work begun.

Contract No. 36.— For constructing sixteen operating winches for movable dams in the Mohawk river.

At Dam No. 5, Rotterdam, a derrick was erected for placing winches.

At Dam No. 6, Cranesville, the winches were erected and brass fixtures, etc., removed and stored.

Contract No. 13.— For three bridge superstructures on Contract No. 12 and two on Contract No. 18.

Work on this contract remains as on December 1.

Contract No. 2-E.— For completing the construction of the canal from the Mohawk river at Waterford to a point about one-fourth of a mile above the head of Lock No. 3.

Work closed for the winter.

Contract No. 11.— For prism excavation and construction from Contract No. 2 to Mohawk river below Crescent, including Locks Nos. 4, 5 and 6, highway, bridge abutments, guard-gate, masonry, etc.

Work closed for the winter.

Contract No. 14.— For work from Contract No. 11 to a point near Rexford Flats aqueduct, including Lock No. 7 and Dams Nos. 2 and 3; also for constructing Locks Nos. 13, 14 and 15, Dams Nos. 9, 10 and 11, Mindenville retaining dam, etc.

At Dam No. 9, Lock No. 13, Yosts, all uprights were placed and cross frames and diagonals connected. Gates for the north span were also placed.

Contract No. 14-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 14 to new burial plots outside the flow lines.

No work was done.

Contract No. 20-D.— For dredging Mohawk river channel, constructing stream entrances, etc., between deep water below Rexford Flats aqueduct and center of bridge at Dam No. 9, at Yosts.

Quarrying and delivery of riprap stone for creek entrance work continued. The hull of the hydraulic dredge building at West Amsterdam is nearly ready to launch and the hull for a steam tug has been started.

Contract No. 8.— For constructing Dam No. 4 and Lock No. 8, at Scotia; Dam No. 5 and Lock No. 9, at Rotterdam; Dam No. 6 and Lock No. 10, at Cranesville, all on the Mohawk river.

At Dam No. 5, Lock No. 9, Rotterdam, steel erection was completed, riveting progressed and contact strips were placed. Anchor bolt holes were drilled, railing erected, plant dismantled, etc. Bridge decking is being placed. Quantities: Iron and steel, 34,330 lbs.; sawed lumber, 6,460 ft. B. M.

Contract No. 17.— For constructing Dam No. 7 and Lock No. 11, at Amsterdam, and Dam No. 8 and Lock No. 12, at Tribes Hill.

Final estimates being prepared.

Contract No. 20-C.— For dredging Mohawk river channel, constructing stream entrances, etc., between center of bridge at Dam No. 9, at Yosts, and center of bridge at Dam No. 10, at Canajoharie.

Riprap stone quarried and placing completed. Stone for stream entrance work at Flat creek was quarried and hauled.

Contract No. 86.— For the construction of one span of a highway bridge over the Mohawk river at Canajoharie, to replace two existing spans, which will be removed.

Repairs to the bottom chord of the defective span of the Canajoharie bridge were in progress, but no contract work was done.

Contract No. 20-B.— For dredging Mohawk river channel, constructing stream entrances, etc., between the center of bridge at Dam No. 10, at Canajoharie, and the upper miter wall of the new lock at Mindenville.

No construction work done. Alterations and general repairs to plant and hauling supplies continued.

Contract No. 20-A.— For dredging Mohawk river channel, etc., between Castle creek and upper miter wall of lock at Little Falls.

In the land line, the steam-shovel removed 4,541 cu. yds. of rock and earth to spoil on the south side. Drilling and pumping to drain the cut continued. Weather conditions delayed work.

Contract No. 31.— For improving the Erie canal at Little Falls, constructing Lock No. 17, and modifying the dam and constructing guard-gates at Rocky Rift.

Prism excavation progressed. West of the guard-gates some cleaning of prism to grade was done. More remains to be done. Small stones were used as riprap and to finish slopes. Large stones were spoiled.

At retaining wall No. 2 and at Little Falls guard-gates, concreting was finished. About 23 cu. yds. of dry retaining wall were laid on the south side. Some 216 cu. yds. of riprap were laid for roadway. The guard-gates at Little Falls were operated satisfactorily.

The mixer and crusher plant at the elevator were dismantled. The pile false work at the arch of Lock No. 17 was removed to the surface of the ice. The trestle was removed. The west section of the coffer-dam at the west end of the contract was removed by the Acme Engineering and Contracting Co. Quantities: Excavation, 2,128 cu. yds.; concrete, 376 cu. yds.

Contract No. 30.— For dredging channel in Mohawk river and land line from Little Falls to Sterling creek, constructing Lock No. 18 at Jacksonburg, Dam No. 14 and guard-gates at Herkimer, retaining dam at Frankfort, bridges, etc.

Three-quarters of the contract clearing has been done. The coffer-dam at the east end of the contract was removed, after some delay, and excavation by a Thew shovel and a guy derrick continued. The output of earth, 1,011 cu. yds., was spoiled on the Casler property and the rock excavated was either spoiled or

stored for future use. The dredges *Herkimer* and *Clinton* have been under repair. Tower No. 2 was moved to the south side of the river and resumed building dikes on released lands near Ilion. Plant was overhauled and general work done. Quantities: Excavation, 3,293 cu. yds.

Contract No. 29.— For excavating prism from Sterling creek to Oneida-Herkimer county line, constructing lock at Sterling creek, bridges, etc.

General work was confined to backfilling at the north lock with debris from the work at the railway crossing, overhauling machinery and transferring some plant from the lock to near West Schuyler bridge for future use.

Contract No. 42.— For prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillway, stream entrances, culverts, etc.

The total excavation was 8,891 cu. yds., of which 5,005 cu. yds. were taken from the south side of the new river channel and the remainder from approaches to Lock No. 20.

At Park avenue bridge, 108,400 lbs. of steel were placed and riveting began. Work was delayed by severe weather and the installation of additional plant.

Lidgerwood excavator No. 2, operating in the new channel, continued working west on triple shifts, the frozen ground requiring dynamiting. On February 10 the machine ceased work for the winter. The Marion steam-shovel operating in the lower approach to Lock No. 20 also closed down with its attendant drills and dump train, on the same date.

Contract No. 43.— For constructing the canal from a point just south of Oriskany road to about 1,500 feet west of Mud creek.

The dredge *Stanwix* removed 17,288 cu. yds. of material from the prism. At the spillway, a drag-line excavator removed 13,520 cu. yds., also from the prism. At Oriskany road bridge, about 48,879 lbs. of structural steel were placed over the canal and river channel. This and the Mill street bridge are substantially completed.

Contract No. 44.— For constructing the canal from about 1,500 feet west of Mud creek, west of Rome, to about three miles west

of New London, including junction lock, Locks Nos. 21 and 22, bridges, culverts, spillways, stream entrances, etc.

About 17,710 cu. yds. of material were excavated. In the prism, Marion shovel 883 removed 6,563 cu. yds. At the junction lock, Bucyrus shovel 841 removed 5,503 cu. yds. At Lock No. 21, a derrick and clam-shell removed 983 cu. yds. At Lock No. 22, a tower scraper removed 4,661 cu. yds.

At Lock No. 21, 4,863 sq. ft. of steel piling were used at the lower south approach wall and 37,538 lbs. of structural steel were placed in the bridge of the lock.

Contract No. 12.— For excavating prism between Oneida lake and Mosquito Point bridge on Seneca river; constructing Lock No. 23 and other structures.

Repairs to plant were continued but no contract work was done.

Contract No. 22.— Bridges on Contract No. 12.

At Bonta's bridge the coffer-dam around the site of pier No. 1 was completed and the site unwatered. Excavation is being carried on. The north span of the superstructure has been practically assembled and about one-half of the floor system riveted.

At Free bridge work was resumed on February 20. The site of the south abutment was cleared of ice and snow, unwatered and excavation began. High water subsequently overflowed the coffer-dam, stopping work. A mixer was installed and runways made to crushed stone.

Contract No. 46.— For the construction of the canal from Fox Ridge to the southeast corner of the town of Galen, including Lock No. 25, a movable dam at May's Point, bridges, etc.

Steel piling, to be used at Lock No. 25, is being hauled from railroad to May's Point. No construction work was done.

Contract No. 47.— For the construction of the canal from the southeast corner of the town of Galen to a point near the N. Y. C. & H. R. railway crossing at Lyons, including Lock No. 26, a dam across the Clyde river, highway bridge, stream entrance, etc.

Coffer-dams are being built and plant erected for work on the dam at Lock No. 26. About 259 cu. yds. were excavated. The steel work at the lock has been hampered to some extent by the breaking of the coffer-dam. About two days' work remain

to be done on the lock gates, which will be done after the ice goes out.

Contract No. 5-A.— For the completion of Contract No. 5, from Mosquito Point to Campbell's bridge, including construction of Owasco creek entrance, reconstruction of bridge at Mosquito Point and new pier and approaches at Howland island bridge, etc.

Recently awarded. Work not yet begun.

Contract No. 48.— For the construction of the canal from a point near the N. Y. C. & H. R. railway crossing at Lyons to a point near the West Shore railway crossing at East Newark, including Locks Nos. 27 and 28-A, dam and power-house, retention dam across Canandaigua outlet, spillway, culverts, highway, bridge, approaches, etc.

The dipper-dredge *Erie* is completed. The dredge *Lyons,* operating in prism, has reached Geneva street, removing 41,030 cu. yds. of material. At Geneva street work on retaining wall and bridge abutments progressed very slowly, due to extreme cold. About 567 cu. yds. of material were excavated from the site of the wall and 264 cu. yds. at the abutments.

At the lower approach of Lock No. 27, 1,124 cu. yds. were excavated and 13,000 ft. B. M. of sheeting and bracing driven. Some coping stone were set at the Poorhouse bridge. The Browning crane removed 3,830 cu. yds. of material from prism near the railroad bridge.

Contract No. 76.— For the construction of the canal from a point near the West Shore railway crossing at East Newark to a point about one-half mile east of Port Gibson.

At the west end of the contract two steam-shovels have removed 64,741 cu. yds. of material from the prism, 8,622 cu. yds. of which were placed in embankment and the balance in spoil. No other work has been in progress.

Contract No. 77.— For constructing the canal from one-half mile east of Port Gibson to one-half mile west of Palmyra, including Lock No. 29, power-plant, bridges, culverts, etc.

At the big cut, shovel 22 excavated 24,493 cu. yds. of material. At Galloway's, 100 cu. yds. were removed by hand for abutments. In Port Gibson valley about 128,000 ft. B. M. of sheet piling

were driven under the embankment. At the spillway 335 cu. yds. were excavated and 408 cu. yds. of concrete were laid. About 108 lin. ft. of foundation piles were also driven. The suction dredge *Palmyra* resumed work on February 11 and removed 26,966 cu. yds. of material from prism. About 11,615 cu. yds. of embankment were formed in Port Gibson valley from material hauled from Contract No. 76. Some painting was done on Maple avenue bridge.

Contract No. 49.— For prism construction from a point about 500 ft. east of Yellow Mills bridge, about one mile west of Palmyra, to the Monroe county line, including Lock No. 30, sluice-gates, highway bridges, culverts, etc.

The Lidgerwood excavator removed 15,740 cu. yds. of material from the prism. At Wayneport bridge 28 cu. yds. of concrete were placed, to complete the structure. About 74 cu. yds. of wash wall were placed east of Lock No. 30.

Contract No. 63.— For enlarging present canal and constructing culverts, sluiceways, waste-weir, guard-gates, dock walls, bridges, highway changes, etc., between Wayne-Monroe county line and Kings Bend.

The Lidgerwood excavator discontinued operations owing to excessive frost in ground. The Fogarty machine worked until February 17 in the new channel of Thomas creek and then closed down. Four steam-shovels worked the entire month at various places in the prism between Bushnell's Basin and Monroe avenue bridge in Pittsford. A fifth shovel started up on February 19, on tow-path side west of Cobb's bridge, spoiling material adjacent. Excavating was also done at culverts Nos. 28 and 33, Cartersville and Bushnell's Basin guard-gates, Irondequoit trough and Mitchell's bridge.

Second-class concrete, plain and reinforced, was placed in Irondequoit trough, at culverts Nos. 30 and 33, Cartersville guard-gate and at Cartersville and Main street Pittsford bridges. Foundation piles were driven for south abutment of Cartersville bridge. The superstructure of Bushnell's Basin bridge has been riveted and part of the Main street Pittsford bridge. Steel for Fullam's Basin bridge was delivered at site.

Quantities: Excavation, 49,107 cu. yds.; concrete, 5,826 cu. yds.; piles, 944 lin. ft.

Contract No. 23.— For prism excavation between Kings Bend and Genesee river, and construction of Locks Nos. 32 and 33, guard-lock, bridges, culverts, etc.

The steam-shovels stopped work on account of extreme cold weather. East Henrietta road bridge was erected ready for riveting. Quantities: Excavation, 1,840 cu. yds.; steel, 88,518 lbs.

Contract No. 21.— For prism excavation and construction of bridge abutments, guard-lock, etc., from the Genesee river west 2.56 miles to a point just west of the N. Y. C. & H. R. railway crossing.

Electric drainage pumps continued operating at Brooks avenue and at Scottsville road. Both steam-shovels have been practically idle the entire month on account of changing position, failure of pumping plant and extreme cold. Excavation about 500 cu. yds. From 3 to 5 channeling machines worked most of the month and channeled 4,009 sq. ft. of prism lines. Five steam-drills worked until February 10 and then closed down.

Contract No. 82.— For furnishing and erecting three steel highway bridge superstructures on Contract No. 21, near Rochester.

The Scottsville road bridge was painted and the floor laid.

Contract No. 75.— For construction of three guard-gate superstructures on Contracts Nos. 60, 61 and 64.

The superstructure of the guard-gate just west of Brockport on Contract No. 61 has been erected, ready for riveting.

At the Spencerport guard-gate, one gate and about 75 per cent of the center tower and one end tower have been erected, ready for riveting.

Contract No. 60.— For prism excavation and construction of culverts, bridge structures, etc., between a point 1.75 miles east of South Greece and a point 0.5 mile west of Adams Basin.

Excavating by locomotive crane and by hand and Koppel cars has been done at various places in the prism, turning basin and for puddle lining. Most of the material was placed in the north approach of bridge No. 95, the remainder going to embankment or spoil. Steam-drills worked the entire month on rock above grade in various places. Excavation, 8,843 cu. yds.; embankment, 7,435 cu. yds.; dry stone work, 700 cu. yds.

Contract No. 61.— For prism excavation and construction of culverts, bridges, waste-weir, etc., between a point 0.5 mile west of Adams Basin and Monroe-Orleans county line.

Lidgerwood excavator No. 1 worked in prism, rehandling material into embankment on the north side, the frozen portion being spoiled. Lidgerwood excavator No. 2 has been idle. Lidgerwood excavator No. 3 excavated the old south bank and bed of prism, casting material into north embankment, spoiling frozen material back of it. Earth and rock were also excavated by hand and teams at various places in the prism. Cast-iron pipe for culvert No. 59 has been hauled to the site. Quantities: Excavation, 19,397 cu. yds.; embankment, 2,920 cu. yds.

Contract No. 62.— For prism excavation and construction of culverts, bridge substructures, etc., between Orleans-Monroe county line and a point near Eagle Harbor bridge.

Albion section:

Excavation was continued by steam-shovel, derrick and clam-shell west of Brockville bridge; by steam-shovel and locomotive crane west of Transit bridge; by team outfit east of Bidwell's bridge; by steam-shovel west of Hall's bridge; by Lidgerwood excavator west of Gaines bridge; at Eagle Harbor trough and waste-weir, Lattin's guard-gate, south vertical wall at Albion and culverts Nos. 71, 73, 75, 82 and 83.

Embankment was formed by clam-shell west of Brockville bridge; by locomotive crane west of Transit bridge; by steam-shovel west of Hall's bridge and by Lidgerwood excavator west of Gaines bridge.

Second-class concrete was laid at abutments of Brockville and Braley's bridges, south vertical wall at Albion, Lattin's guard-gate, Eagle Harbor trough and waste-weir. Material for Brockville bridge was delivered at site.

Some third-class concrete was laid at culverts Nos. 82 and 83. About 2,292 lbs. of reinforcement were used at Eagle Harbor trough. About 45,350 lbs. of cast-iron pipe and specials were placed at culvert No. 82.

Quantities: Excavation, 36,139 cu. yds.; embankment, 9,384 cu. yds.; concrete, 1,992 cu. yds.

Holley section:

About 42,500 cu. yds. were excavated by four steam-shovels at as many different points. About 1,498 cu. yds. of second-class concrete were laid at Holley trough and waste-weir and at

culvert No. 70, 82 cu. yds. of third-class at culvert No. 63 and 25 cu. yds. of reinforced at culvert No. 70, using 7,648 lbs. of reinforcement. About 622 cu. yds. of rubble masonry were also laid at Hulberton walls. At culvert No. 63, 34,300 lbs. of cast-iron pipe and specials were also placed. At Orr's bridge some 98,712 lbs. of structural steel were placed. At McCarthy's guard-gate 35,000 lbs. of metal were used.

Contract No. 64.— For improvement from 600 ft. west of Prospect street, Medina, to 100 ft. east of Gasport bridge.

Team outfits and Thew shovel removed about 3,476 cu. yds. of earth and rock from prism at various stations. Some 2,717 cu. yds. of embankment were also formed. About 34 cu. yds. of concrete were laid at the guard-gate east of Gasport.

Contract No. 66.— For prism excavation and constructing bridges and approaches, culverts, etc., from 100 ft. east of Gasport bridge to 600 ft. east of Lockport locks.

The total excavation for the month was 6,663 cu. yds. At Gasport the Browning crane equipped with scale buckets removed 3,122 cu. yds., mostly rock. Between Orangeport and Millard's bridge, the Wellman-Seaver crane and the derrick-boat excavated 1,446 cu. yds. from the prism during the first part of the month. Between Lake avenue bridge and the west end of the contract, the Marion shovel and two trains supplemented by hand labor removed 2,095 cu. yds. of earth and rock from the prism. About 313 cu. yds. of concrete were placed in the berme retaining wall east of the Angelus Mills, Lockport. Some 394 cu. yds. of wash wall were laid at various places along the contract.

Contract No. 67.— For construction of Locks Nos. 34 and 35 and approaches, etc., at Lockport.

The total excavation for the month was 10,982 cu. yds. The Thew shovel and one train removed 1,558 cu. yds. of earth from the south side of the prism near the east end of the contract, during the first three weeks of the month. A derrick with clamshell, working in Lock No. 34 for one week, took out 407 cu. yds. of earth. The 70-ton Bucyrus shovel and four trains removed 9,424 cu. yds. of rock from the prism west of Lock No. 35.

About 436 cu. yds. of concrete were placed in the south retaining wall near the east end of the contract. Nine girders, with a total of 629,185 lbs. of structural steel, were placed in the super-

structure of Main street bridge. About 133,889 lbs. of metal were placed in gates at the upper end of Lock No. 35. About 1,400 lin. ft. of piles were driven on site of south retaining wall at east end of contract.

Contract No. 40.— For constructing the canal, culvert entrances, guard-gates, stream entrances, bridges, etc., from the Lockport locks to Sulphur Springs guard-lock.

The total excavation for the month was 81,913 cu. yds. The Bucyrus shovel with three trains in the harbor section removed 11,037 cu. yds. Shovel No. 15 with double-boom crane, one-half mile east of Hitchin's bridge, removed 20,418 cu. yds. About 935 cu. yds. of rock were removed by derrick and hand labor near Hinman road and placed in wash wall in the earth section to the west. Shovel No. 14 and cableway No. 2 removed 12,309 cu. yds. of rock just west of Hinman road. The cantilever removed 14,192 cu. yds. of earth, one-half mile west of Riley's bridge. The Browning excavator and tipple took out 10,521 cu. yds. of earth, east of the new guard-gate. Hand labor and cableway No. 1 removed 1,474 cu. yds. of earth at the new guard-gate. Shovel No. 17 and two trains removed 4,601 cu. yds. of silt, about a thousand feet east of the old guard-lock. Shovel No. 16 and three trains took out 3,118 cu. yds., about 1,500 feet east of the old guard-gate. Shovel No. 20 and three trains removed 3,308 cu. yds. of earth near the guard-lock. Some 2,047 cu. yds. of wash wall and fourth-class riprap were laid at various places between Hinman road and the guard-gate. Material for Summit street bridge was delivered at site.

Contract No. 19.— For prism excavation, rebuilding bridges, constructing masonry culvert, concrete-capped pile docking, etc., between Sulphur Springs guard-lock and mouth of Ellicott creek.

The total excavation for the month was 4,979 cu. yds., all of which were removed by the Marion shovel and two trains at Pendleton. Repairs to the dipper-dredge *Buffalo* continued and repairs to the hydraulic dredge *Niagara* began on February 19. The rebuilding of cribs for ice protection at the Pendleton change bridge was finished on February 17.

Champlain Canal.

Contract No. 70.—For dredging a channel in the Hudson river from outlet of Barge canal at Waterford to Lock No. 1.

No contract work done.

Contract No. 71.— For constructing Lock No. 1 and Dam No. 1, above Waterford, and dredging Hudson river from Lock No. 1 to lower Mechanicville lock.

At Smith's, rock excavation was discontinued on February 7, plant removed and track taken up. No work was done at other points on the contract. Excavation, 3,035 cu. yds.

Contract No. 69.— For constructing Lock No. 2, at lower Mechanicville.

Excavation in lock chamber continued until February 20. Material for upper and lower gates was received and unloaded. The upper buffer-beam was placed. Upper gates are being assembled. Placing of iron in valve-wells continued. Framing of gate-timbers and bridge floor was in progress.

Contract No. 72.— For dredging Hudson river from lower Mechanicville to Stillwater.

At Stillwater construction of a coffer-dam around the submerged steam-shovel continued until the middle of the month, when the work was stopped without removing the shovel. Repairs to plant are in progress.

At Hart's the north coffer-dam was repaired and the dipper-dredge removed to winter quarters. Repairs are in progress.

Contract No. 68.— For constructing Lock No. 3, at Mechanicville; making prism excavation and constructing Lock No. 4, at Stillwater; prism excavation and Lock No. 5, at Northumberland.

No contract work was done.

Contract No. 88.— For the construction of a steel highway bridge at Schuylerville, within the limits of Contract No. 73.

The bridge is being fabricated.

Contract No. 1.— For dredging Hudson river from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; constructing Crocker's Reef dam and approaches to "Land Line," etc.

Work closed down indefinitely.

Contract No. 24.— For constructing guard-gate at Crocker's Reef.

Stone for wash wall are being received from Middle Falls by electric railway. All wash wall, save coping, which can be laid at this time, is now in place. This leaves a 25-foot section on the west slope where embankment is yet to be built and portions on the east slope where excavation is not completed. About 1,080 cu. yds. of wash wall were placed.

Contract No. 54.— For constructing Lock No. 7, at Fort Edward.

About 540 cu. yds. were excavated. A 28-foot section completed the core fall, in which were placed 79 cu. yds. of concrete. About 5,360 lin. ft. of foundation piles and 23,000 ft. B. M. of wooden sheet-piling were driven in the southeast section of the lock site. Further pile-driving was held up on account of deep frost.

Contract No. 27-A.— For completing the construction of the canal between the Hudson river at Fort Edward and the south end of Contract No. 25, at Dunhams Basin road.

About 3,500 cu. yds. were excavated, south of Lock No. 8, south of Argyle street, in foundations to piers and abutments of Broadway bridge and in north approach wall to Lock No. 7. About 14,750 ft. B. M. of sheeting and bracing were used in excavating for bridge piers and abutments and approach wall to Lock No. 7. About 2,400 cu. yds. of embankment were placed in the west approach to Argyle street bridge and along the west side of the prism. Some 35 20-ft. foundation piles and 10,000 ft. B. M. of sheet-piling were driven under the north approach wall to Lock No. 7. Some 209 cu. yds. of reinforced concrete were placed in the east abutment and pier of the Broadway bridge. About 533 cu. yds. of wash wall were built near East street. Steel was erected and riveted for Baldwin avenue and East street bridges over Bond creek. Some 7,600 lbs. of metal reinforcement were used and 66 25-ft foundation piles driven at Broadway bridge.

Contract No. 25.— For prism excavation between a point 0.6 mile north of Comstock post-office and highway crossing at Dunhams Basin; constructing Lock No. 9, spillways, power-plant, etc.

The total excavation was 1,569 cu. yds., of which 259 cu. yds. were from rock cut at Dunhams, 1,112 cu. yds. from rock cut 1½ miles north of Fort Ann and the remainder at Henry's bridge.

At the cut north of Fort Ann, 141 15-ft. piles were driven for riprap protection and 245 cu. yds. of second-class riprap laid.

At the northwest approach wall of Lock No. 9, about 3,120 ft. B. M. of sawed lumber were used and 50 cu. yds. of concrete laid. Some 484 cu. yds. of wash wall were laid at the wooden lock. Some trimming of the rock cut was done here and at the cuts north of Fort Ann and Smiths Basin.

Contract No. 15.— For prism excavation and constructing Lock No. 11, Dam No. 4; Lock No. 12, Dam No. 5; spillway, culverts, highway, bridges and other structures between a point 0.6 mile north of Comstock post-office and Lake Champlain at Whitehall.

Contract finished. Final estimates approved by the Canal Board February 28, 1912.

OSWEGO CANAL.

Contract No. 39.— For dredging channel in Oswego river, constructing stream entrances, excavating through Hinmansville cut-off, etc., between Three River Point and Fulton, except portion covered by Contract No. 53.

No contract work was done.

Contract No. 85.— For constructing a steel bridge over the lock at Phoenix.

No contract work was done.

Contract No. 80.— For constructing a concrete dam across the Oswego river at Phoenix.

But little work was done. Some 75 cu. yds. of old dam were removed. About 5,124 lbs. of metal were placed in the Taintor gates.

Contract No. 10-A.— For completing the construction of the canal, raising the upper dam, etc., from Broadway bridge, Fulton, south to Contract No. 39.

About 1,550 cu. yds. of material were excavated from the prism and about 200 cu. yds. of embankment were formed back of the east wall. Some progress was made in removing old plant, debris, etc.

Contract No. 78.— For constructing a dike on Oswego river, near Fulton.

Final estimates being prepared.

Contract No. 79.— For the construction of two spans of a highway bridge over the river at Bridge street, in connection with six other similar spans to be constructed by the city of Oswego.

Contract completed. Final estimates being prepared.

Contract No. 37.— For dredging a channel in Oswego river, constructing Locks Nos. 5 and 6, dams, bulkheads and other structures, and the removal of Battle Island and High dams, between Contract No. 10, at Fulton, and Contract No. 35, at Oswego.

No contract work was done.

Contract No. 35.— For prism excavation and constructing Locks Nos. 7 and 8, bulkheads, culverts, spillways, etc., between a point one-half mile above Utica street bridge and harbor line north of Bridge street, at Oswego.

A derrick was erected but no contract work was done.

Cayuga and Seneca Canal.

Contract A.— For constructing Lock No. 1 and Dam No. 1, near Cayuga.

A small amount of excavation in lieu of sheeting and bracing was done. About 2,748 cu. yds. were removed.

Contract B.— For excavating a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from Cayuga lake to Seneca Falls and from Waterloo to deep water in Seneca lake.

No contract work was done.

Contract H.— For excavating a channel in Cayuga lake inlet at Ithaca from a point about 300 feet north of Cascadilla street, to deep water in Cayuga lake.

Recently awarded. No contract work done.

Water-Supply.

Contract No. 50.— For constructing dam, waste-gates and spillway across West Canada creek at Hinckley.

Some more wood was cut by local parties.

Contract No. 51.— For constructing a canal feeder from Trenton Falls on West Canada creek to Nine-Mile creek below South Trenton, with gate-house, culverts, highway, etc.

A small amount of clearing was done. Shovel No. 1 continued excavating the feeder prism, cutting the full section and spoiling material on adjacent bank. Excavation, 5,126 cu. yds.

Contract No. 55.— For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black River canal, with four locks and aqueduct over Mohawk river, highway change, bridges, etc.

The only work done on the contract during the month was the removal of the old aqueduct and the adjacent highway bridge over the Mohawk river. These structures were sold in place by the contractor and their removal was undertaken by the purchasers. The Rome-Westernville highway passing through the site was closed on February 19. On the highway work, about 3,482 cu. yds. were excavated and 2,225 cu. yds. of embankment formed.

Contract No. 55-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 55, Delta reservoir, to a new cemetery outside the flow lines.

No contract work was done.

Power-Supply.

Contract No. 91.— For building and equipping a hydro-electric power-plant on the Erie canal near the east end of Crescent dam.

Teams continued hauling stone. No contract work was done.

Contract No. 90.— For constructing hydro-electric power-plants at Baldwinsville on the Erie canal, and at Smiths, Comstock and Whitehall on the Champlain canal. Also for constructing equipment for operating and lighting the following locks: No. 24, Erie canal; Nos. 1, 2, 7 and 8, Oswego canal; Nos. 9, 11 and 12, Champlain canal.

On the Champlain canal, at Locks Nos. 11 and 12, some work was done in wiring, setting poles and lamps, etc. On the Oswego canal, at Lock No. 1, a small amount of valve and gate-operating machinery was installed. At Lock No. 7, about 10 tons of iron counterweights were placed.

Progress of Plans Being Prepared.

The following pages contain detailed accounts of the plans in process of preparation at the main and residency offices, showing

progress up to the first of February. An order according to location is followed, as explained in the account of contract work for the month.

ERIE CANAL.

Contract No. 74.— For dredging Mohawk river from Hudson river to Contract No. 2-E. Plans held for further consideration.

Contract No. 18-A.— For completing the construction of the canal from Mindenville to Castle creek. Plans 83 per cent completed.

Contract No. 101.— For the construction of a steel highway bridge superstructure at Three River Point. Plans 80 per cent completed.

Contract No. 57.— Syracuse harbor. Plans completed, but held for further consideration.

Contract No. 84.— For the construction of two steel lift bridges at Clyde, within the limits of Contract No. 47. Work on plans suspended, pending an investigation as to elimination of grade crossing.

Contract No. 89.— For the construction of seven superstructures and one substructure for highway bridges between Lyons and Palmyra on Contracts Nos. 48, 76 and 77. Plans completed.

Contract No. 59.— For constructing a movable dam in the Genesee river at Rochester. Plans 90 per cent completed.

Contract No. 65.— For work from the west end of Contract No. 9, at a point near Beal's bridge, to the east end of Contract No. 64, at a point 600 feet west of Prospect street, Medina, including Oak Orchard creek crossing. Plans are being prepared for a change of route, following practically the line of the present canal and crossing Oak Orchard creek at the site of the present aqueduct. Plans 35 per cent completed.

CHAMPLAIN CANAL.

Contract No. 56.— Glens Falls feeder. Plans 85 per cent completed.

OSWEGO CANAL.

Contract No. 103.— For the construction of a reinforced concrete arch bridge over part of the Oswego river at Phoenix. Plans 95 per cent complete.

Cayuga and Seneca Canal.

The contracts on this canal may be rearranged. For the present the old order is retained.

Contract C.— For constructing Lock No. 2 and Dam No. 2, near Demont's bridge. Plans under revision.

Contract D.— For constructing Lock No. 3 and excavating prism east of Seneca Falls. Plans under revision.

Contract E.— For constructing Lock No. 4 at Seneca Falls, three highway bridges, etc. Plans 70 per cent completed.

Contract G.— For dredging a channel in the Seneca river from Lock No. 4, at Seneca Falls, to Contract B, at Waterloo. Plans 50 per cent completed.

Contract F.— For constructing Lock No. 5 and dam at Waterloo. Plans 55 per cent completed.

Contract I.— For improving the canal from deep water in Seneca lake to Montour Falls, about 2.75 miles. Plans under way.

Contract J.— For improving Glen creek from the highway bridge in the village of Watkins to the canal improvement. Plans under way.

Power-Supply.

Contract No. 92.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 2, 3, 4, 5, 6 and 7, on the Erie canal, and Locks Nos. 6 and 8, on the Champlain canal. Plans 95 per cent completed.

Contract No. 90-A.— For constructing hydro-electric power-plants, sub-stations and equipments to complete installations at Locks Nos. 1, 2, 7 and 8, Oswego canal. Plans 95 per cent completed.

Contract Advertised.

Contract No. 105.— For the construction of five lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Union street, Spencerport; Washington street, Adams Basin; Park avenue, Brockport; Hulberton; Gasport.

Engineer's estimate, $253,010. Drawings 31 sheets. To be completed by May 1, 1913. Bids to be opened April 9, 1912.

Award of Contracts.

Contract No. 104.— For the construction of a reinforced concrete arch bridge over the Barge canal at Broadway, Fulton. Bids were opened on December 20.

Contract No. 10-B.— For completing the construction of the canal from the upper end of Lock No. 2, Fulton, north to Contract No. 37.

Bids were opened on February 27. Four bids were received, the lowest being that of Fred W. Sarr, of No. 11 First street, Fulton, N. Y., to whom it was subsequently awarded at $491,295. The detailed bids appear elsewhere in this issue.

RECAPITULATION — PROGRESS ON PLANS.

Contract No.	DESCRIPTION.	Canal.	Progress on plans.
10B	Fulton, north to Contract 37	Oswego	Awarded.
18A	Mindenville to Castle creek	Erie	83 per cent completed.
56	Glens Falls feeder	Champlain	85 per cent completed.
57	Syracuse harbor	Erie	Held for consideration.
59	Rochester harbor dam	Erie	90 per cent completed.
65	Canal and aqueduct	Erie	35 per cent completed.
74	Dredging, Hudson river to Contract 2-E	Erie	Under consideration.
84	Two lift-bridges at Clyde	Erie	Suspended.
89	Bridges on Contracts 76 and 77	Erie	Completed.
90A	Supplementary to Contract 90	Oswego	95 per cent completed.
92	Power-house and lock equipments	Erie, Champlain	95 per cent completed.
101	Bridge at Three River Point	Erie	80 per cent completed.
103	Bridge at Phoenix	Oswego	95 per cent completed.
1C4	Bridge at Fulton	Oswego	Bids opened Dec. 20.
105	Five lift-bridges between Rochester and Lockport	Erie	Advertised.
C	Lock 2, near Demont's bridge	Cayuga and Seneca	Under revision.
D	Lock 3 and prism, east of Seneca Falls	Cayuga and Seneca	Under revision.
E	Lock 4 at Seneca Falls	Cayuga and Seneca	70 per cent completed.
F	Lock 5 and dam at Waterloo	Cayuga and Seneca	55 per cent completed.
G	Dredging, Seneca Falls to Waterloo	Cayuga and Seneca	50 per cent completed.
I	Watkins to Montour Falls	Cayuga and Seneca	Under way.
J	Glen creek at Watkins	Cayuga and Seneca	Under way.

ITEMS.	Measure.	Quantities.	Engineer's Estimate.		The Lake Erie Dredging Co., 1104 D. S. Morgan Bldg., Buffalo, N. Y.		Walter Bradley, Fulton, N. Y.		Fred W. Sarr, 11 First St., Fulton, N. Y.		The T. A. Gillespie Co., 50 Church St., New York City.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.
Grubbing	cu. yd.	200	$0 50	$100 00	$0 545	$109 00	$0 50	$100 00	$0 50	$100 00	$0 50	$100 00
All excavation	cu. yd.	88,140	1 75	154,245 00	1 9075	168,127 05	2 10	185,094 00	2 00	176,280 00	2 10	185,094 00
Sheeting and bracing	M. ft. B. M.	10	40 00	400 00	43 60	436 00	40 00	400 00	45 00	450 00	45 00	450 00
Channeling	sq. ft.	25,000	50	12,500 00	545	13,625 00	57	14,250 00	50	12,500 00	60	15,000 00
Forming embankment	cu. yd.	23,600	35	8,260 00	38	8,968 00	35	8,260 00	20	4,720 00	42	9,912 00
Lining	cu. yd.	570	1 50	855 00	1 635	931 95	1 50	855 00	1 80	1,026 00	1 50	855 00
Ballast	cu. yd.	2,200	2 00	4,400 00	2 18	4,796 00	2 00	4,400 00	1 80	3,960 00	2 25	4,950 00
Spruce sawed lumber	M. ft. B. M.	270	50 00	3,500 00	54 50	3,815 00	50 00	3,500 00	50 00	3,500 00	60 00	4,200 00
White oak sawed lumber (miter-sills)	M. ft. B. M.	3 1	100 00	310 00	109 00	337 90	100 00	310 00	120 00	372 00	100 00	310 00
First-class concrete	cu. yd.	600	12 00	7,200 00	13 08	7,848 00	12 00	7,200 00	10 00	6,000 00	14 00	8,400 00
Second-class concrete	cu. yd.	35,700	8 00	285,600 00	8 72	311,304 00	8 30	296,310 00	7 25	258,825 00	9 60	342,720 00
Finishing concrete surfaces	sq. ft.	8,000	10	800 00	11	880 00	10	800 00	07	560 00	10	800 00
Repairing tops of concrete walls	cu. ft.	2,000	2 00	4,000 00	2 18	4,360 00	2 00	4,000 00	2 00	4,000 00	2 40	4,800 00
Vitrified pipe, 12-inch	lin. ft.	70	60	42 00	65	45 50	60	42 00	70	49 00	60	42 00
Trenching and backfilling, 12" pipe	lin. ft.	70	1 00	70 00	1 09	76 30	1 00	70 00	1 20	84 00	1 00	70 00
Cobblestone paving	sq. yd.	310	1 00	310 00	1 09	337 90	1 00	310 00	1 00	310 00	1 00	310 00
Stone paving, first-class	sq. yd.	4,800	3 00	14,400 00	3 27	15,696 00	3 00	14,400 00	2 00	9,600 00	3 60	17,280 00
Stone paving, second-class	sq. yd.	640	2 00	1,280 00	2 18	1,395 20	2 00	1,280 00	1 50	960 00	2 00	1,280 00
Wash wall	cu. yd.	295	2 50	737 50	2 725	803 87	2 50	737 50	2 50	737 50	2 50	737 50
Steel castings	lb.	6,550	06	393 00	065	425 75	07	458 50	06	393 00	07	458 50
Iron castings, plain	lb.	128,600	03½	4,501 00	038	4,886 80	04	5,144 00	03½	4,501 00	04	5,144 00
Iron castings, machined	lb.	40,000	10	4,000 00	11	4,400 00	10	4,000 00	08	3,200 00	10	4,000 00
Structural steel	lb.	28,100	05	1,405 00	055	1,545 50	05	1,405 00	05	1,405 00	05	1,405 00
Metal reinforcement	lb.	66,700	04	2,668 00	044	2,934 80	04	2,668 00	03	2,001 00	04	2,668 00
Log chain, ¾-inch	lb.	7,800	10	780 00	11	858 00	10	780 00	08	624 00	10	780 00
Expansion bolts in place	each	55	1 50	82 50	1 635	89 93	1 50	82 50	1 50	82 50	1 50	82 50
Wrought iron pipe railing	lin. ft.	300	2 00	600 00	2 18	654 00	2 00	600 00	1 50	450 00	2 00	600 00
Repairs to "light boist," bulkhead 1	lump sum	.....	.....	50 00	54 50	54 50	50 00	50 00	50 00	50 00	50 00	50 00
Repairing second-class riprap	cu. yd.	85	3 00	255 00	3 27	277 95	3 00	255 00	3 00	255 00	3 00	255 00
Removing buildings	lump sum	.....	.....	300 00	327 00	327 00	300 00	300 00	300 00	300 00	300 00	300 00
Cleaning up site of contract, dressing old spoil banks, etc., and all other work not included in items 1 to 30	.....	.....	.....	8,000 00	8,720 00	8,720 00	9,600 00	9,600 00	1,000 00	1,000 00	9,500 00	9,500 00
Total	.....	.....	.....	$522,044 00		$569,066 90		$567,661 50		$498,295 00		$622,553 50
Deduct price to be paid N. Y. State by contractor for crib coffer-dam at end of site of Lock No. 3	lump sum	.....	.....	7,000 00	7,000 00	7,000 00	7,000 00	7,000 00	7,000 00	7,000 00	7,000 00	7,000 00
Total	.....	.....	.....	$515,044 00		$562,066 90		$560,661 50		$491,295 00		$615,553 50

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APRIL, 1912

Barge Canal Bulletin

Series V No. 4

DEPARTMENT OF

THE STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
ALEXANDER E. KASTL, Special Deputy State Engineer

ISSUED MONTHLY UNDER THE AUTHORITY OF THE STATE ENGINEER, BY THE BUREAU OF PUBLICATION AND REPORTS, DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR

CONTENTS

Progress of Contract Work..... 106
Brief Account of Contract Work for March..... 108
Progress of Plans Being Prepared..... 125
Plans before Canal Board..... 127
Contract Advertised..... 127
Award of Contract..... 128

Progress of Contract Work.

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to April 1, 1912.
		Put under contract.*	Done to April 1, 1912.	Done during March, 1912.	
1	Empire Engineering Corporation	$580,424	$474,400	0	81.8
2	Ferguson Contracting Co. *a*	968,512	694,390	0	73.0
2E	Holler & Shepard *b*	(283,890)	251,130	0	88.6
3	Sundstrom & Stratton	657,273	633,290	0	Finished.
4	Empire Engineering Corporation	726,780	720,073	0	Finished.
4B	E. J. Doyle & Company	1,351	1,332	0	Finished.
5	Empire Engineering Corporation *a*	156,941	125,820	0	80.2
5A	James Stewart & Company *b*	(317,597)	0	0	0.0
6	F. A. Maselli	1,026,550	1,033,864	0	Finished.
7	Groton Bridge Company	101,930	98,929	0	Finished.
8	Pittsburg-Eastern Company *a*	1,516,789	920,420	0	60.7
9	Thomas Crimmins Contracting Co	803,297	655,461	0	Finished.
10	McDermott Contracting Company *a*	1,111,965	668,360	0	60.1
10A	The T. A. Gillespie Company *b*	(101,144)	8,900	$5,230	8.9
10B	Fred W. Sarr *b*	(491,295)	0	0	0.0
11	Fort Orange Construction Company	1,352,999	1,154,410	0	85.4
12	James Stewart & Company	3,555,467	2,366,560	0	66.6
13	Penn Bridge Company	28,126	20,180	0	71.7
14	Acme Engineering & Contracting Co	2,985,225	2,472,110	15,820	82.8
14R	Thomas F. Riley	724	470	0	65.0
15	Atlantic, Gulf & Pacific Co	1,481,692	1,378,956	0	Finished.
16	United Construction Company	78,715	32,450	7,960	41.2
17	The Scofield Company *a*	842,418	57,560	0	6.9
17	Alexander Murdoch *b*	(812,286)	743,610	0	91.5
18	Kelley Bros. Contracting Company	611,382	476,979	0	Finished.
19	Great Lakes Construction Company	891,401	717,270	1,800	80.5
20A	Houston Barnard	490,592	196,350	5,670	40.0
20B	Pearsons & Son, Inc	933,194	258,960	0	27.7
20C	American Pipe & Construction Co	585,720	395,890	0	67.6
20D	American Pipe & Construction Co	2,685,477	84,920	0	3.2
21	Lane Brothers Company	1,323,150	562,530	730	42.5
22	M. Fitzgerald	117,194	24,260	400	20.7
23	Millard & Lupton Company	1,808,797	843,010	3,870	46.6
24	James D. Sherrill	44,368	5,840	0	13.2
25	Atlantic, Gulf & Pacific Company	1,694,037	1,445,060	4,310	85.3
26	Lake Erie Dredging Company	40,057	35,443	0	Finished.
27	Kinser Construction Company *a*	723,269	378,650	0	Finished.
27A	Holler & Shepard *b*	(449,562)	124,880	4,750	27.8
29	Maryland Dredging & Contr'g Co	674,250	405,680	0	60.2
30	Acme Eng'r'g & Contracting Co	2,558,955	1,034,850	820	40.5
31	Casey & Murray	831,302	696,180	8,020	83.7
32	Penn Bridge Company	46,797	44,375	0	Finished.
33	Penn Bridge Company	199,640	164,550	0	82.5
34	M. Fitzgerald	22,449	22,258	0	Finished.
35	Gilmour-Horton-Allen Company	748,045	510,580	970	68.2
36	J. D. Miller	46,800	46,800	0	Finished.
37	Henry P. Burgard	2,366,677	962,430	1,660	40.6
38	Henry Tosh & Son	16,870	16,287	0	Finished.
39	James Stewart & Company	1,048,674	146,240	0	14.0
40	United Eng'r'g & Contracting Co	2,252,144	1,615,850	84,580	71.7
41	Butler Bros. Construction Company	273,238	241,644	0	Finished.
42	Shanley-Morrissey, Inc	1,047,366	476,780	1,040	45.5
43	M. A. Talbott Company	1,365,876	167,980	3,520	12.3
44	Scott Brothers	1,758,068	714,950	3,190	40.7
45	Scott Brothers	472,802	418,652	0	Finished.
46	Kinser Construction Company	1,291,805	693,210	50	53.7
47	Crowell-Sherman-Stalter Company	1,279,328	792,430	1,690	61.9
48	Crowell-Sherman-Stalter Company	1,670,695	385,470	49,980	23.2
49	American Pipe & Construction Co	729,000	385,520	12,240	52.8
50	Buffalo Dredging Company	964,884	123,210	0	12.8
51	Alto Construction Company	396,670	91,140	1,490	23.1
53	Scott Brothers	167,585	164,576	0	Finished.
54	Hunkin-Conkey Construction Co	250,590	94,120	2,920	37.5
55	Arthur McMullen	945,840	861,340	0	91.0
55R	Joseph Kalk & Alfred S. Brown	7,561	5,630	0	74.4
60	Empire Engineering Corporation	1,491,317	1,232,860	6,050	82.6
61	Cleveland & Sons Company	1,088,890	695,160	28,630	64.0
62	I. M. Ludington's Sons, Inc	2,373,126	1,098,020	104,300	46.4
63	H. S. Kerbaugh, Inc	2,334,853	1,052,700	122,410	45.1

Progress of Contract Work—(*Continued*).

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to April 1, 1912.
		Put under contract.*	Done to April 1, 1912.	Done during March, 1912.	
64	Empire Engineering Corporation	$1,335,434	$740,840	$3,150	55.5
66	Empire Engineering Corporation	829,284	686,580	6,700	82.9
67	Larkin & Sangster	1,149,401	501,590	41,650	43.6
68	Shanley-Morrissey, Inc	1,024,282	946,168	678	Finished.
69	I. A. Hodge & Company	240,061	189,430	3,560	78.9
70	Shanley-Morrissey, Inc	779,636	236,240	0	30.3
71	Shanley-Morrissey, Inc	1,561,119	821,960	0	52.7
72	Shanley-Morrissey, Inc	1,202,658	618,900	0	52.3
73	E. M. Graves	518,829	517,223	0	Finished.
75	United Construction Company	42,917	17,980	4,890	41.9
76	The T. A. Gillespie Company	1,512,011	666,220	47,530	44.1
77	The T. A. Gillespie Company	1,677,482	802,870	61,510	47.8
78	Cunningham-Woodard Company	49,026	47,723	433	Finished.
79	Lupfer & Remick	37,480	33,730	0	Finished.
80	Walter Bradley	117,391	108,130	0	92.1
82	Groton Bridge Company	28,841	21,200	0	73.5
85	Lupfer & Remick	13,151	1,960	30	14.9
86	Lathrop, Shea & Henwood Co	43,440	4,940	0	11.3
88	Lathrop, Shea & Henwood Co	25,658	0	0	0.0
90	D'Olier Engineering Company	180,318	161,510	3,850	89.6
91	The Hollington Company	42,940	7,000	260	16.3
104	R. B. Murdock	39,370	0	0	0.0
	Totals	$73,098,642	$42,556,383	$658,341	.....

Cayuga and Seneca Canal.†

A	Scott Brothers	$357,627	$124,570	$3,660	34.8
B	Crowell-Sherman-Stalter Co	1,436,597	466,570	0	32.5
H	James H. Dawes	179,769	0	0	0.0
	Totals	$1,973,993	$591,140	$3,660	.....

* Includes all alterations in force to date. *a* Suspended by order of the Canal Board. *b* Relet to complete former contracts, contract price not included in total. † Authorized by separate appropriation.

Brief Account of Contract Work for March.

The following pages show what has been done during the month on the several contracts now in force on the Barge canal. The Erie canal contracts are described in order from Waterford west to Buffalo, and the Champlain and Oswego canal contracts follow, in order from south to north, while the Cayuga and Seneca canal contracts are given from east to west.

Erie Canal.

Contract No. 33.— Lock-gates and valves, guard-gates, etc., on Contracts Nos. 2, 10, 11 and 15.

No contract work done.

Contract No. 16.— For eleven steel highway bridges, ten of which are at various points on Contracts Nos. 25 and 27, Champlain canal, and the remaining one on Contract No. 11, Erie canal.

At Smiths Basin bridge, false work was set and structural steel to the amount of 140,000 lbs. was unloaded and erected.

At Fort Ann bridge, stringers were set and the structure cleaned for painting.

At Dewey's bridge, 9,000 ft. B. M. of flooring were laid.

At Comstock bridge, erecting and riveting the structure was completed. Some 150,817 lbs. of steel were placed. About 184 lin. ft. of sidewalk railing were erected on bridge and approach and 13,000 ft. B. M. of flooring and sidewalk were laid.

Contract No. 36.— For constructing sixteen operating winches for movable dams in the Mohawk river.

Winches were placed at Rotterdam and those for Scotia were delivered.

Contract No. 13.— For three bridge superstructures on Contract No. 12 and two on Contract No. 18.

No contract work done.

Contract No. 2-E.— For completing the construction of the canal from the Mohawk river at Waterford to a point about one-fourth mile above the head of Lock No. 3.

No work was done.

Contract No. 11.—For prism excavation and construction from Contract No. 2 to Mohawk river below Crescent, including Locks Nos. 4, 5 and 6, highway, bridge abutments, guard-gate, masonry, etc.

No work was done.

Contract No. 14.—For work from Contract No. 11 to a point near Rexford Flats aqueduct, including Lock No. 7 and Dams Nos. 2 and 3; also for constructing Locks Nos. 13, 14 and 15, Dams Nos. 9, 10 and 11, Mindenville retaining dam, etc.

At Dam No. 9, Lock No. 13, Yosts, all gates have been placed and are being painted. Some repairs are being made to complete the steel work. The contact strips are placed. The bridge flooring is laid, except at cantilever ends, where the work is progressing. Quantities: Sawed lumber, 22,434 ft. B. M.; metal in gates, 187,091 lbs.

Contract No. 14-R.—For the removal of bodies from cemeteries located within the flooded area of Contract No. 14 to new burial plots outside the flow lines.

No work was done.

Contract No. 20-D.—For dredging Mohawk river channel, constructing stream entrances, etc., between deep water below Rexford Flats aqueduct and center of bridge at Dam No. 9, at Yosts.

About 1,000 cu. yds. of riprap and paving stone were quarried and delivered from the quarry at Tribes Hill. At Amsterdam the new hydraulic dredge is ready to launch and the steam-tug is nearly ready. A large dump-scow is being built.

Contract No. 8.—For constructing Dam No. 4 and Lock No. 8, at Scotia; Dam No. 5 and Lock No. 9, at Rotterdam; Dam No. 6 and Lock No. 10, at Cranesville, all on the Mohawk river.

At Scotia and at Cranesville no contract work was done, although at the former place State employees began moving the winches as delivered into a storehouse purchased from the contractor.

At Rotterdam the remainder of the contact-strips were placed on the gates, completing this dam except for painting and setting some anchor-bolts.

In the issue of December last the suspension of work on this contract by order of the Canal Board was noted. By further action of the Canal Board on March 11, 1912, Contract No. 8 was cancelled, plans for the remainder of the work to be prepared, readvertised and relet.

Contract No. 17.—For constructing Dam No. 7 and Lock No. 11, at Amsterdam, and Dam No. 8 and Lock No. 12, at Tribes Hill.

Final estimates being prepared.

Contract No. 20-C.—For dredging Mohawk river channel, constructing stream entrances, etc., between center of bridge at Dam No. 9, at Yosts, and center of bridge at Dam No. 10, at Canajoharie.

Quarrying and delivery of stone for creek entrance work at Flat creek continued. General repairs to plant at Canajoharie progressed.

Contract No. 86.—For the construction of one span of a highway bridge over the Mohawk river at Canajoharie, to replace two existing spans, which will be removed.

No contract work was done. Repairs to the defective span by the towns were completed.

Contract No. 20-B.—For dredging Mohawk river channel, constructing stream entrances, etc., between the center of bridge at Dam No. 10, at Canajoharie, and the upper miter wall of the new lock at Mindenville.

No construction work done. Alterations and general repairs to plant continued.

Contract No. 20-A.—For dredging Mohawk river channel, etc., between Castle creek and upper miter wall of lock at Little Falls.

The steam-shovel continued excavation of rock in the land line, removing 7,077 cu. yds. Drilling and pumping to drain the cut continued.

Contract No. 31.—For improving the Erie canal at Little Falls, constructing Lock No. 17, and modifying the dam and constructing guard-gates at Rocky Rift.

Excavation for prism and retaining walls continued, about 3,061 cu. yds. being removed, of which some of the smaller stone were used in riprap. The remainder was spoiled. About 90 cu. yds. of embankment were formed. Retaining wall No. 4 was completed and work on Alteration No. 4 progressed. About 620 cu. yds. of concrete were placed. Some 352 cu. yds. of riprap were laid. At the west end drilling and blasting high spots in the prism bottom continued.

Contract No. 30.— For dredging channel in Mohawk river and land line from Little Falls to Sterling creek, constructing Lock No. 18 at Jacksonburg, Dam No. 14 and guard-gates at Herkimer, retaining dam at Frankfort, bridges, etc.

Rock excavation has regularly progressed during the month, 1,957 cu. yds. having been removed. The main prism excavation is now nearing completion. The machinery of the dipper-dredge has been changed and it is now equipped with a 16-in. direct pumping outfit. The 20-in. hydraulic dredge has been undergoing repairs. Tower No. 2 built dikes near Ilion. Plant was overhauled and general repairs made.

Contract No. 29.— For excavating prism from Sterling creek to Oneida-Herkimer county line, constructing lock at Sterling creek, bridges, etc.

Operations were confined to unloading large supplies of coal, overhauling machinery, backfilling at Lock No. 19, and protecting the west end of the washer fill at the lock site from the flood of Sterling creek.

Contract No. 42.— For prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillway, stream entrances, culverts, etc.

The total excavation was 4,520 cu. yds. most of which came from the lower approach to Lock No. 20. A Blake pump was operated for water supply. The hydraulic dredge was also in operation on triple-shift, pumping out the prism, and another boiler and pump were operated during high water. At Park avenue bridge a small amount of riveting was done. About 4,500 lbs. of steel were used. Coal was hauled from Schuyler street to the dredge.

Contract No. 43.— For constructing the canal from a point just south of Oriskany road to about 1,500 feet west of Mud creek.

About 19,547 cu. yds. were excavated from ditches and ditch entrances on south side by drag-line excavator.

Contract No. 44.— For constructing the canal from about 1,500 feet west of Mud creek, west of Rome, to about three miles west of New London, including junction lock, Locks Nos. 21 and 22, bridges, culverts, spillways, stream entrances, etc.

About 7,412 cu. yds. of material were excavated from prism, of which Marion shovel 883 removed 1,867 cu. yds.; Bucyrus shovel 841 removed 2,425 cu. yds. at junction lock; derrick and clam-shell took out 1,906 cu. yds. at Lock No. 21; tower No. 1 excavated 1,214 cu. yds. at Lock No. 22. Some 6,373 sq. ft. of second-quality steel piling were driven at Lock No. 21.

Contract No. 12.—For excavating prism between Oneida lake and Mosquito Point bridge on Seneca river; constructing Lock No. 23 and other structures.

No contract work done. Repairs to plant continued.

Contract No. 22.— Bridges on Contract No. 12.

High water conditions retarded contract work. At Free bridge some work on south abutment was done. Foundation piles were sawed off and a boom constructed to protect supports from ice. At Bonta's bridge the north span is erected and about two-thirds riveted..

Contract No. 46.— For the construction of the canal from Fox Ridge to the southeast corner of the town of Galen, including Lock No. 25, a movable dam at May's Point, bridges, etc.

No contract work done.

Contract No. 47.— For the construction of the canal from the southeast corner of the town of Galen to a point near the N. Y. C. & H. R. railway crossing at Lyons, including Lock No. 26, a dam across the Clyde river, highway bridge, stream entrance, etc.

About 689 cu. yds. were excavated for the dam. About 814 cu. yds. of embankment were formed in the lower approach, partly

from spoil. About 12,700 ft. B. M. of sawed lumber were shaped into needles during the month, completing this work.

Contract No. 5-A.— For the completion of Contract No. 5, from Mosquito Point to Campbell's bridge, including construction of Owasco creek entrance, reconstruction of bridge at Mosquito Point and new pier and approaches at Howland Island bridge, etc.

Work not yet begun.

Contract No. 48.— For the construction of the canal from a point near the N. Y. C. & H. R. railway crossing at Lyons to a point near the West Shore railway crossing at East Newark, including Locks Nos. 27 and 28-A, dam and power-house, retention dam across Canandaigua outlet, spillway, culverts, highway, bridge, approaches, etc.

The suction dredge *Lyons* passed the temporary bridge at Geneva street and the bridge was rebuilt the first of the month, having been closed six days. Taking advantage of the high water, the *Lyons* moved to a point above the site of Lock No. 27 and commenced operating on March 20, working west in the prism. During the month the dredge has taken out 88,963 cu. yds. of material. The dipper-dredge *Erie* began work March 11, breaking ice and loosening hard material in prism. At Geneva street bridge little has been done, owing to high water. About 779 cu. yds. were excavated and 1,620 lin. ft. of foundation piles driven. The Browning excavator removed 9,707 cu. yds. of material from the prism near the N. Y. C. R. R. crossing.

Contract No. 76.— For the construction of the canal from a point near the West Shore railway crossing at East Newark to a point about one-half mile east of Port Gibson.

Both Marion steam-shovels continued work, removing 81,950 cu. yds. from prism to spoil. Steel work progressed at Lock No. 28-B. About 138,600 lbs. were placed in buffer-beams, lock-gates and valves.

Contract No. 77.— For constructing the canal from one-half mile east of Port Gibson to one-half mile west of Palmyra, including Lock No. 29, power-plant, bridges, culverts, etc.

At the east end of the contract, sheet-piling under the embankment was completed. About 78,600 ft. B. M. were driven and 3,910 lbs. of structural steel placed in wales. At the big cut, steam-shovel No. 22 removed 22,403 cu. yds. of material from the prism. At Galloway's bridge 1,002 cu. yds. were excavated and 629 cu. yds. of concrete placed in south abutment. Harrison's spillway was completed, placing 295 cu. yds. of concrete. The plant was then moved to Galloway's bridge. The suction dredge *Palmyra,* working intermittently, removed 30,445 cu. yds. of material from prism. At Maple avenue bridge the floor system was painted.

Contract No. 49.— For prism construction from a point about 500 ft. east of Yellow Mills bridge, about one mile west of Palmyra, to the Monroe county line, including Lock No. 30, sluice-gates, highway bridges, culverts, etc.

About 43,308 cu. yds. were excavated from the prism, of which the Lidgerwood excavator removed 24,816 cu. yds., the 70-ton McMyler 222 cu. yds. and the suction dredge *Fairport* 18,270 cu. yds. At Wayneport bridge, 900 cu. yds. of lining were placed in front of abutments. At the east end of the contract 222 cu. yds. of wash wall were built.

Contract No. 63.— For enlarging present canal and constructing culverts, sluiceways, waste-weir, guard-gates, dock walls, bridges, highway changes, etc., between Wayne-Monroe county line and Kings Bend.

The Lidgerwood excavator remained idle during the month. The Fogarty excavator operated in prism west of Wiltsie's bridge, using material on north approach to the bridge. Five steam-shovels were in operation throughout the month. One worked westerly to Main street, Fairport; one worked in the cut for Irondequoit trough; one cut out old banks and joined old to new prism at Cartersville; another cleaned prism bottom from Cartersville wide waters to State street bridge; the fifth cut out south side of prism from W. S. R. R. to Monroe avenue bridge. Most of the material was spoiled. Some was used in embankment at Irondequoit trough and Cartersville bridge. Other excavation was by hand at culverts Nos. 28 and 33, Parker street, Cartersville and Monroe avenue bridges and at Cartersville guard-gate.

Concrete was placed in Irondequoit trough, Cartersville guard-gate, culverts Nos. 28 and 33, and Mitchell's, Cartersville and Monroe avenue bridges. Parker street bridge was closed to traffic and a temporary bridge was built at Monroe avenue.

In steel work: Main street, Pittsford, bridge is riveted and the wooden floor is being laid; Mitchell's bridge is erected and riveting has begun; Bushnell's basin bridge is riveted and the floor laid; at Cartersville guard-gate the substructure is completed and steel for the gates and towers is being hauled to the site.

Qantities: Excavation, 99,460 cu, yds.; embankment, 27,595 cu. yds.; concrete, 8,722 cu. yds.

Contract No. 23.—For prism excavation between Kings Bend and Genesee river, and construction of Locks Nos. 32 and 33, guard-lock, bridges, culverts, etc.

At Lock No. 33 a steam drainage pump was in operation part of the month. A small amount of excavation by hand for road culverts and slope trimming was done. A few cu. yds. of concrete were placed in abutments at West Henrietta road bridge. At the East Henrietta road bridge the superstructure was erected and riveted and nailing strips for floor were placed in position. Riveting also began on the Clinton avenue bridge. Repairs are being made. The cableway at Lock No. 32 is being dismantled. Quantities: Concrete, 21 cu. yds.; iron and steel, 884,021 lbs.

Contract No. 21.— For prism excavation and construction of bridge abutments, guard-lock, etc., from the Genesee river west 2.56 miles to a point just west of the N. Y. C. & H. R. railway crossing.

Electric drainage pumps continued operating at Brooks avenue and at Scottsville road. Steam-shovel work was resumed March 25, excavating for the P. R. R. bridge abutments, but was suspended on March 28. The B. R. & P. R. R. company also began work at their crossing.

Contract No. 82.— For furnishing and erecting three steel highway bridge superstructures on Contract No. 21, near Rochester.

The Scottsville road bridge was completed and opened to traffic on March 9. This bridge and the Brooks avenue bridge are now both completed and in use, leaving only the bridge at Chili road to be constructed.

Contract No. 75.—For construction of three guard-gate superstructures on Contracts Nos. 60, 61 and 64.

At the Brockport guard-gate riveting began the first of the month and was completed about March 20. The force then moved to the Spencerport guard-gate, where the riveting is about half completed. At the Middleport guard-gate the work of erection began on March 13. The north span is in place.

Contract No. 60.—For prism excavation and construction of culverts, bridge structures, etc., between a point 1.75 miles east of South Greece and a point 0.5 mile west of Adams Basin.

Excavating by locomotive crane, teams and by hand with Koppel cars was done at various places in the prism, turning basin, and for puddle lining. Some of the excavation was trimming slopes. Part of the material was placed in north approach of bridge No. 95 and part was placed on both banks above the pool level, or spoiled back of banks. Steam-drills were used where rock occurred above grade. Considerable lining was placed on tow-path at various places. Temporary tow-paths of timber were built in front of north abutments of bridges Nos. 96 and 100. Quantities: Excavation, 8,285 cu. yds.; embankment, 7,710 cu. yds.; dry stone work, 302 cu. yds.

Contract No. 61.— For prism excavation and construction of culverts, bridges, waste-weir, etc., between a point 0.5 mile west of Adams Basin and Monroe-Orleans county line.

Lidgerwood excavator No. 1 excavated the entire month in prism, including material previously spoiled there and casting it either into north embankment or to spoil in rear. Lidgerwood excavator No. 2 was idle. Lidgerwood excavator No. 3 excavated the full prism section, casting material into north embankment or spoiling it outside. Other excavation of earth and rock by hand was done at culvert No. 58 and at several places in prism. The north abutment of bridge No. 110, the trunk of culvert No. 58 and about 30 feet of the trunk of culvert No. 59, were completed. Quantities: Excavation, 22,821 cu. yds.; embankment, 23,294 cu. yds.; concrete, 253 cu. yds.; dry stone work, 119 cu. yds.; iron and steel, 254,847 lbs.

Contract No. 62.—For prism excavation and construction of culverts, bridge substructures, etc., between Orleans-Monroe county line and a point near Eagle Harbor bridge.

Abion section:

Excavation was continued by steam-shovel, traveling derrick and clam-shell east of Hindsburg bridge; by steam-shovel and dinkey car outfit east of culvert No. 78; by an orange-peel bucket east of culvert No. 73; by a McMyler excavator west of Hindsburg bridge; at culverts Nos. 71, 73, 75, 78 and 82; at Bidwell's, Hall's, Main street and Gaines bridges; at south vertical wall at Albion; Eagle Harbor trough and Lattin's guard-gate. Embankment was formed by clam-shell bucket east of Hindsburg bridge; by steam-shovel west of culvert No. 78; by orange-peel bucket east of culvert No. 73, and by the crane west of Transit bridge. Second-class concrete was laid at culvert No. 73; at Bidwell's, Hall's, Hindsburg, Brailey's and Gaines bridges; at Albion wall, Lattin's guard-gate and Eagle Harbor trough and waste-weir. Third-class concrete was laid at culvert No. 82. Reinforced concrete was laid at culverts Nos. 71 and 73, Transit bridge and Brockville waste-weir. About 46,908 lbs. of cast-iron pipe were laid at culverts Nos. 71, 73 and 82. About 123,-355 lbs. of structural steel were used at Brockville bridge. Some 18,342 lbs. of metal reinforcement and 345 lbs. of expanded metal were used at Brockville waste-weir.

Quantities: Excavation, 25,567 cu. yds.; embankment, 581 cu. yds.; concrete, 4,434 cu. yds.

Holley section:

Four steam-shovels excavated 22,812 cu. yds. of material during the month. About 2,482 cu. yds. of concrete were laid at Holley trough and waste-weir and culverts Nos. 63 and 70. Some 28,188 lbs. of cast-iron pipe and specials were placed at culvert No. 63. About 1,318 cu. yds. of rubble masonry were laid in walls at Hulberton. About 8,262 lbs. of reinforcing metal were used at Holley trough.

Contract No. 64.— For improvement from 600 ft. west of Prospect street, Medina, to 100 ft. east of Gasport bridge.

The total excavation for the month was 3,039 cu. yds. Embankment to the extent of 1,581 cu. yds. was formed on both sides of the prism. About 440 cu. yds. of wash wall were built. Boat building continued at Middleport.

Contract No. 66.— For prism excavation and constructing bridges and approaches, culverts, etc., from 100 ft. east of Gasport bridge to 600 ft. east of Lockport locks.

The total excavation for the month was 8,466 cu. yds. At Gasport, the Browning crane with scale buckets and hand labor removed 2,621 cu. yds. of earth and rock from the prism. The Wellman-Seaver crane and hand labor at Orangeport excavated 700 cu. yds. of earth from the prism. At Millard's bridge the derrick-boat and hand labor excavated 750 cu. yds. of earth At Young's bridge the new Browning crane and hand labor removed 260 cu. yds. of earth. Between Lake avenue and Exchange street bridge, the Marion shovel and two trains took out 3,975 cu. yds. of earth and rock. At the west end of the contract some trimming of the bottom was done by hand, distributing the material in places excavated below grade. The estimate for this was 160 cu. yds. About 248 cu. yds. of concrete were placed in the berme facing wall, west of the Angelus Mills, completing it.

Contract No. 67.— For construction of Locks Nos. 34 and 35 and approaches, etc., at Lockport.

The total excavation for the month was 17,639 cu. yds. About 733 cu. yds. of earth were removed from the prism near the east end of the contract by one derrick and hand labor and backfilled at the new south retaining wall. Two derricks and two trains with hand labor removed 1,664 cu. yds. of earth and rock from the site of the lower guide wall and Lock No. 34. The 70-ton Bucyrus shovel and five trains excavated 15,242 cu. yds. of rock from the prism west of Lock No. 35. The south retaining wall at the beginning of the contract was completed by the laying of 483 cu. yds. of concrete. About 250 lin. ft. of additional piling were driven for the foundation of this wall. About 601 cu. yds. of concrete were placed in the buffer-beam section of Lock No. 34. At Main street bridge 153,825 lbs. of steel were placed in the floor system. The field connections of the 20 girders in place are about one-third riveted. The gates at the upper end of Lock No. 35 were riveted and the fitting of quoin and miter-posts commenced. One steel valve was placed in the south wall at the upper end of Lock No. 35.

Contract No. 40.— For constructing the canal, culvert entrances, guard-gates, stream entrances, bridges, etc., from the Lockport locks to Sulphur Springs guard-lock.

The total excavation for the month was 91,043 cu. yds. The Bucyrus shovel with three trains near Prospect street bridge re-

moved 3,312 cu. yds. of rock. Shovel No. 15 and double-boom crane east of Hitchin's bridge removed 25,549 cu. yds. of rock. Shovel No. 14 and cableway No. 2 just west of Hinman road removed 10,118 cu. yds. of earth and rock. The cantilever removed 24,639 cu. yds. of earth one-half mile west of Riley's bridge. The Browning excavator and tipple one-half mile west of Hawley's bridge took out 10,505 cu. yds. of earth. Hand labor and cableway No. 1 removed 1,356 cu. yds. at the new guard-gate. Shovel No. 16 and 3 trains took out 10,436 cu. yds. of earth and rock one-fourth mile east of the guard-lock. Shovel No. 20 and 3 trains removed 5,128 cu. yds. just east of the guard-lock.

About 45 cu. yds. of concrete were placed in the vertical wall along the tow-path east of the guard-lock. About 1,485 cu. yds. of fourth-class riprap were placed, of which 1,317 cu. yds. were on both sides west of Riley's bridge and 168 cu. yds. on both sides east of the guard-gate. Riley's and Summit street bridges were erected and riveted. About 11,011 lbs. of structural steel were used at the former and 163,400 lbs. at the latter location. About 300 lin. ft. of lattice railing were also erected at Summit street. Erection of the new guard-gate was started. About 12,600 lbs. of metal were placed in the middle tower.

Contract No. 19.—For prism excavation, rebuilding bridges, constructing masonry culvert, concrete-capped pile docking, etc., between Sulphur Springs guard-lock and mouth of Ellicott creek.

The total excavation for the month was 3,000 cu. yds., all of which was removed by the Marion steam-shovel and two trains west of the guard-lock. Work was stopped on March 9, as the removal of rock was finished. Repairs on the dredges *Niagara* and *Buffalo* were continued.

Champlain Canal.

Contract No. 70.— For dredging a channel in the Hudson river from outlet of Barge canal at Waterford to Lock No. 1.

No contract work done.

Contract No. 71.— For constructing Lock No. 1 and Dam No. 1, above Waterford, and dredging Hudson river from Lock No. 1 to lower Mechanicville lock.

No construction work was done. The material for the gates of Lock No. 1 was received and unloaded. High water on March 16 overflowed the bank at the lock, endangering the plant at this point. The water soon receded without damaging the plant, but carried the coffer-dam and a portion of the permanent dike east of the lock into the channel, allowing the water to pass down the new channel below the lock.

Contract No. 69.— For constructing Lock No. 2, at lower Mechanicville.

The upper gates of the lock are practically riveted. Gate timbers are being framed and iron placed in valve wells. The floor system of the bridge was painted and nailing strips are being placed. The blocks of the floor system are assembled and are being asphalted. High water in the lock chamber stopped work on gates and valve wells. Quantities: Sawed timber, 2,472 ft. B. M.

Contract No. 72.— For dredging Hudson river from lower Mechanicville to Stillwater.

No contract work was done. At Hart's siding repairs to plant continued. On March 13, the ice in the Hoosic river came down and gorged at the Stillwater coffer-dam, causing some damage to it. The hydraulic dredge in winter quarters at Lock No. 3 sank on March 14.

Contract No. 68.— For constructing Lock No. 3, at Mechanicville; making prism excavation and constructing Lock No. 4, at Stillwater; prism excavation and Lock No. 5, at Northumberland.

Contract completed. Final estimates approved by Canal Board March 27, 1912.

Contract No. 88.— For the construction of a steel highway bridge at Schuylerville, within the limits of Contract No. 73.

The bridge is being fabricated.

Contract No. 1.— For dredging Hudson river from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; constructing Crocker's Reef dam and approaches to "Land Line," etc.

Work closed down indefinitely.

Contract No. 24.— For constructing guard-gate at Crocker's Reef.

The wash wall was finished March 2. No work was done during the balance of the month.

Contract No. 54.— For constructing Lock No. 7, at Fort Edward.

About 454 cu. yds. of concrete were laid in footing courses of west wall of lock. High water came over the coffer-dam and shut down this work. A place on the tow-path was levelled for a new concrete plant and some of the old plant was dismantled and removed. About six days were lost by reason of inclement weather.

Contract No. 27-A.— For completing the construction of the canal between the Hudson river at Fort Edward and the south end of Contract No. 25, at Dunhams Basin road.

About 563 cu. yds. were removed by hand loaded skips at the siphon spillway, west pier of Broadway bridge and under northwest approach wall of Lock No. 7. About 5,928 ft. B. M. of sheeting and bracing were used at the siphon spillway and 800 ft. B. M. at the west pier of Broadway bridge. At the northwest approach of Lock No. 7, 36 20-ft. foundation piles and 18,792 ft. B. M. of sheet-piling were driven and 107 cu. yds. of concrete were laid. Some 93 cu. yds. of reinforced concrete were placed in the east abutment and pier of Broadway bridge, completing these structures. South of East street about 386 cu. yds. of wash wall were built on the west side of the prism. High water stopped work on the contract on March 18, since which time only general repairs and removal of plant has been done.

Contract No. 25.— For prism excavation between a point 0.6 mile north of Comstock post-office and highway crossing at Dunhams Basin; constructing Lock No. 9, spillways, power-plant, etc.

The total excavation for the month was 1,711 cu. yds., of which 118 cu. yds. were removed at Henry's bridge and the balance at points farther south. At the work about a mile north of Ft. Ann ten 15-ft. piles were driven, 190 cu. yds. of wash wall built and 628 cu. yds. of riprap laid. At Henry's bridge 124 20-ft. piles were driven, 259 cu. yds. of second-class and 15 cu. yds. of reinforced concrete laid. Concreting and piling were com-

pleted. Repairs to plant were continued at Locks Nos. 9 and 11. To protect the work from damage by high water, ice was blasted at Comstock's, Dewey's, Ft. Ann, Brayton's and Smiths Basin bridges.

Oswego Canal.

Contract No. 39.— For dredging channel in Oswego river, constructing stream entrances, excavating through Hinmansville cut-off, etc., between Three River Point and Fulton, except portion covered by Contract No. 53.

No contract work done.

Contract No. 85.— For constructing a steel bridge over the lock at Phoenix.

Only a small amount of work was done, on the operator's cabin.

Contract No. 80.— For constructing a concrete dam across the Oswego river at Phoenix.

No contract work was done.

Contract No. 10-A.— For completing the construction of the canal, raising the upper dam, etc., from Broadway bridge, Fulton, south to Contract No. 39.

About 2,800 cu. yds. of material were excavated from the prism and 1,146 cu. yds. of embankment were formed. About 158 cu. yds. of wash wall were built. In gratings at Lock No. 2, 2,570 lbs. of structural steel were placed.

Contract No. 10-B.— For completing the construction of the canal from the upper end of Lock No. 2, Fulton, north to Contract No. 37.

Recently awarded. Contract work not begun.

Contract No. 78.— For constructing a dike on Oswego river, near Fulton.

Contract completed. Final estimates approved by the Canal Board, March 20, 1912.

Contract No. 79.— For the construction of two spans of a highway bridge over the river at Bridge street, in connection with six other similar spans to be constructed by the city of Oswego.

Final estimates before Canal Board.

Contract No. 37.— For dredging a channel in Oswego river, constructing Locks Nos. 5 and 6, dams, bulkheads and other structures, and the removal of Battle Island and High dams, between Contract No. 10, at Fulton, and Contract No. 35, at Oswego.

At Battle Island cut-off 955 cu. yds. were excavated by hand and removed by teams.

Contract No. 35.— For prism excavation and constructing Locks Nos. 7 and 8, bulkheads, culverts, spillways, etc., between a point one-half mile above Utica street bridge and harbor line north of Bridge street, at Oswego.

About 400 cu. yds. were excavated. About 10,260 lbs. of steel were placed in the bridge over Lock No. 7.

Cayuga and Seneca Canal.

Contract A.— For constructing Lock No. 1 and Dam No. 1, near Cayuga.

Two travelers equipped with clam-shell buckets excavated 2,432 cu. yds. from the lower lock chamber, spoiling material opposite the lock. Work was delayed by lack of coal and dynamite. About 6,135 lin. ft. of steel sheet-piling were driven at the lower approach walls, completing the east wall and driving 128 lin. ft. in the west wall. Dikes were built and machinery and buildings repaired.

Contract B.— For excavating a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from Cayuga lake to Seneca Falls and from Waterloo to deep water in Seneca lake.

No contract work was done. Repairs on the dredge *Clyde* were continued. Considerable wood was cut from the spoil area between Mud lock and Free bridge. Some of it was used as fuel on the dredge. Other miscellaneous work was done.

Contract H.— For excavating a channel in Cayuga lake inlet at Ithaca from a point about 300 feet north of Cascadilla street, to deep water in Cayuga lake.

Contract recently awarded. Work not yet begun.

Water-Supply.

Contract No. 50.— For constructing dam, waste-gates and spillway across West Canada creek at Hinckley.

No contract work was done.

Contract No. 51.— For constructing a canal feeder from Trenton Falls on West Canada creek to Nine-Mile creek below South Trenton, with gate-house, culverts, highway, etc.

Browning shovel No. 1 continued excavating feeder prism. It was moved to the top of the knoll and is excavating the top cut. A narrow-gage track was built to the spoil bank and material is transported in side-dump cars. Empty cars are drawn back with hoisting engine and cable. Two traveling derricks are being erected for use in prism excavation.

Contract No. 55.— For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black River canal, with four locks and aqueduct over Mohawk river, highway change, bridges, etc.

No work was done on this contract or on the adjacent highways.

Contract No. 55-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 55, Delta reservoir, to a new cemetery outside the flow lines.

No contract work was done.

Power-Supply.

Contract No. 91.— For building and equipping a hydro-electric power-plant on the Erie canal near the east end of Crescent dam.

Work was resumed on March 4. Plant was assembled and a derrick erected. Forms for walls were built. Some machinery arrived. About 28 cu. yds. of concrete were placed in substructure floor.

Contract No. 90.— For constructing hydro-electric power-plants at Baldwinsville on the Erie canal, and at Smiths, Comstock and Whitehall on the Champlain canal. Also for construct-

ing equipment for operating and lighting the following locks: No. 24, Erie canal; Nos. 1, 2, 7 and 8, Oswego canal; Nos. 9, 11 and 12, Champlain canal.

On the Champlain canal:

At Lock No. 11, work progressed in wiring, splicing and testing cables. Capstans were cleaned and adjusted and motors removed for shipment back to factory. Oilers were placed on lower bearings of generators.

At Lock No. 12, governors were erected and adjusted, gate and valve-operating machinery cleaned and adjusted, motors removed for shipment and railing at entrance erected.

On the Oswego canal:

At Lock No. 7, 6,475 lbs. of valve-operating machinery and 3 small motors were installed, 7 lamp-poles erected and miscellaneous electrical equipment placed.

At Lock No. 8, about 1,097 lbs. of metal duct and 2,698 lbs. of insulated conductors were placed.

Progress of Plans Being Prepared.

The following pages contain detailed accounts of the plans in process of preparation at the main and residency offices, showing progress up to the first of April. An order according to location is followed, as explained in the account of contract work for the month.

Erie Canal.

Contract No. 74.— For dredging Mohawk river from Hudson river to Contract No. 2-E. Plans held for further consideration.

Contract No. 18-A.— For completing the construction of the canal from Mindenville to Castle creek. Plans 83 per cent completed.

Contract No. 101.— For the construction of a steel highway bridge superstructure at Three River Point. Plans completed.

Contract No. 57.— Syracuse harbor. Plans completed, but held for further consideration.

Contract No. 84.— For the construction of two steel lift bridges at Clyde, within the limits of Contract No. 47. Work on plans

suspended, pending an investigation as to elimination of grade crossing.

Contract No. 89.— For the construction of five superstructures and one substructure for highway bridges between Lyons and Palmyra on Contracts Nos. 48, 76 and 77. Plans completed.

Contract No. 59.— For constructing a movable dam in the Genesee river at Rochester. Plans 90 per cent completed.

Contract No. 106.— For the construction of four lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Exchange street, Lockport; Middleport; Prospect street, Medina; Main street, Brockport. Plans 95 per cent completed.

Contract No. 65.— For work from the west end of Contract No. 9, at a point near Beal's bridge, to the east end of Contract No. 64, at a point 600 feet west of Prospect street, Medina, including Oak Orchard creek crossing. Plans are being prepared for a change of route, following practically the line of the present canal and crossing Oak Orchard creek at the site of the present aqueduct. Plans 40 per cent completed.

Champlain Canal.

Contract No. 56.— Glens Falls feeder. Plans 85 per cent completed.

Oswego Canal.

Contract No. 103.— For the construction of a reinforced concrete arch bridge over part of the Oswego river at Phoenix. Plans 95 per cent completed.

Cayuga and Seneca Canal.

The contracts on this canal may be rearranged. For the present the old order is retained.

Contract C.— For constructing Lock No. 2 and Dam No. 2, near Demont's bridge. Plans under revision.

Contract D.— For constructing Lock No. 3 and excavating prism east of Seneca Falls. Plans under revision.

Contract E.— For constructing Lock No. 4 at Seneca Falls, three highway bridges, etc. Plans 70 per cent completed.

Contract G.— For dredging a channel in the Seneca river from Lock No. 4, at Seneca Falls, to Contract B, at Waterloo. Plans 50 per cent completed.

Contract F.—For constructing Lock No. 5 and dam at Waterloo. Plans 55 per cent completed.

Contract I.— For improving the canal from deep water in Seneca lake to Montour Falls, about 2.75 miles. Plans under way.

Contract J.— For improving Glen creek, from the highway bridge in the village of Watkins to the canal improvement. Plans under way.

Power-Supply.

Contract No. 92.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 2, 3, 4, 5, 6 and 7, on the Erie canal, and Locks Nos. 6 and 8, on the Champlain canal. Plans 95 per cent completed.

Contract No. 90-A.— For constructing hydro-electric power-plants, sub-stations and equipments to complete installations at Locks Nos. 1, 2, 7 and 8, Oswego canal. Plans 99 per cent completed.

Plans before Canal Board.

Contract No. 8-A.— For constructing Dam No. 4 and Lock No. 8 at Scotia and other incidental work pertaining to the completion of the locks at Rotterdam and Cranesville. Plans before the Canal Board.

Contract Advertised.

Contract No. 105.— For the construction of five lift-bridges over the Erie canal, and all appertaining construction, at the fol-

lowing locations: Union St., Spencerport; Washington St., Adams Basin; Park Ave., Brockport; Hulberton; Gasport. Bids opened April 9, 1912.

Award of Contract.

Contract No. 104.— For the construction of a reinforced concrete arch bridge over the Barge canal at Broadway, Fulton. Contract awarded to R. B. Murdock, of Crown Point, N. Y.

RECAPITULATION — PROGRESS ON PLANS.

Contract No.	DESCRIPTION.	Canal.	Progress on plans.
8A	Supplemental to Contract 8	Erie	Before Canal Board.
18A	Mindenville to Castle creek	Erie	83 per cent completed.
56	Glens Falls feeder	Champlain	85 per cent completed.
57	Syracuse harbor	Erie	Held for consideration.
59	Rochester harbor dam	Erie	90 per cent completed.
65	Canal and aqueduct at Medina	Erie	40 per cent completed.
74	Dredging, Hudson river to Contract 2-E	Erie	Under consideration.
84	Two lift-bridges at Clyde	Erie	Suspended.
89	Bridges on Contracts 48, 76 and 77	Erie	Completed.
90A	Supplemental to Contract 90	Oswego	99 per cent completed.
92	Power-house and lock equipments	Erie, Champlain	95 per cent completed.
101	Bridge at Three River Point	Erie	Plans completed.
103	Bridge at Phoenix	Oswego	95 per cent completed.
104	Bridge at Fulton	Oswego	Awarded.
105	Five lift-bridges between Rochester and Lockport.	Erie	Bids opened April 9.
106	Bridges on Contracts 61, 64, 65 and 67	Erie	95 per cent completed.
C	Lock 2, near Demont's bridge	Cayuga and Seneca	Under revision.
D	Lock 3 and prism, east of Seneca Falls	Cayuga and Seneca	Under revision.
E	Lock 4 at Seneca Falls	Cayuga and Seneca	70 per cent completed.
F	Lock 5 and dam at Waterloo	Cayuga and Seneca	55 per cent completed.
G	Dredging, Seneca Falls to Waterloo	Cayuga and Seneca	50 per cent completed.
I	Watkins to Montour Falls	Cayuga and Seneca	Under way.
J	Glen creek at Watkins	Cayuga and Seneca	Under way.

MAY, 1912

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Barge Canal Bulletin

Series V No. 5

DEPARTMENT OF

THE STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
ALEXANDER E. KASTL, Special Deputy State Engineer

ISSUED MONTHLY UNDER THE AUTHORITY OF THE STATE ENGINEER, BY THE BUREAU OF PUBLICATION AND REPORTS, DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR

CONTENTS

Progress of Contract Work..... 131
Brief Account of Contract Work for April..... 133
Progress of Plans Being Prepared..... 154
Plans before Canal Board..... 156
Contract Advertised..... 156
Award of Contract..... 157
Bids for Contract No. 105..... 158

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Eastern Division Engineer.

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G. F. STICKNEY,
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W. H. YATES,
Supervising Engineer.

BUREAUS:

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G. F. STICKNEY, Supervising Engineer.

Bridges Metalic Structures and Electrical Equipment,
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S. W. BELDING, Resident Engineer.

Mohawk River Residency,
E. A. LAMB, Resident Engineer.

Erie, Residency No. 3,
E. D. HENDRICKS, Resident Engineer.

Erie, Residency No. 4,
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Erie, Residency No. 4-A,
EARLE TALBOT, Resident Engineer.

Erie, Residency No. 5,
D. B. DONOVAN, Resident Engineer.

Erie, Residency No. 6,
D. C. WEDGEWORTH, Resident Engineer.

Erie, Residency No. 7,
EDWARD J. BERRY, Resident Engineer.

Erie, Residency No. 8,
B. E. FAILING, Residency Engineer.

Erie, Residency No. 9,
H. J. KNOPPEL, Supervising Engineer.

Erie, Residency No. 10-A,
J. V. HOGAN, Assistant Engineer.

Erie, Residencies Nos. 10-B and 11,
EDWARD ANDERBERG, Assistant Engineer.

Champlain, Residency No. 1,
F. P. WILLIAMS, Resident Engineer.

Champlain, Residencies Nos. 2 and 3,
E. V. R. PAYNE, Resident Engineer.

Oswego, Residency No. 1,
THERON M. RIPLEY, Resident Engineer.

Oswego, Residency No. 2,
JAMES BURDEN, Resident Engineer.

Cayuga and Seneca Residency,
L. S. HULBURD, Resident Engineer.

Cayuga and Seneca Residency,
A. E. STEERE, Resident Engineer.

Water-Supply Residency,
L. C. HULBURD, Resident Engineer.

TERMINAL DIVISION ENGINEERS:

CARLETON GREENE,
Southern Division Engineer.

GUY L. NOBLE,
Middle Division Engineer.

Progress of Contract Work.

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to May 1, 1912.
		Put under contract.*	Done to May 1, 1912.	Done during April, 1912.	
1	Empire Engineering Corporation	$580,424	$447,400	0	81.8
2	Ferguson Contracting Company *a*	968,512	694,390	0	73.0
2E	Holler & Shepard *b*	(283,990)	251,130	0	88.6
3	Sundstrom & Stratton	657,273	633,290	0	Finished.
4	Empire Engineering Corporation	726,780	720,073	0	Finished.
4B	E. J. Doyle & Company	1,351	1,332	0	Finished.
5	Empire Engineering Corporation *a*	156,941	125,820	0	80.2
5A	James Stewart & Company *b*	(317,597)	0	0	0.0
6	F. A. Maselli	1,026,550	1,033,864	0	Finished.
7	Groton Bridge Company	101,930	98,929	0	Finished.
8	Pittsburg-Eastern Company *a*	1,516,789	920,420	0	60.7
9	Thomas Crimmins Contracting Co	803,297	655,461	0	Finished.
1C	McDermott Contracting Company *a*	1,111,965	668,360	0	60.1
10A	The T. A. Gillespie Company *b*	(101,144)	9,250	$350	9.1
10B	Oswego Construction Company, Inc. *b*	(491,295)	0	0	0.0
11	Fort Orange Constructing Company	1,352,999	1,156,540	2,130	85.5
12	James Stewart & Company	3,555,467	2,371,120	4,560	66.7
13	Penn Bridge Company	28,126	20,180	0	71.7
14	Acme Engr'g & Contracting Company	2,985,225	2,477,540	5,430	83.0
14R	Thomas F. Riley	724	470	0	65.0
15	Atlantic, Gulf & Pacific Company	1,481,692	1,378,956	0	Finished.
16	United Construction Company	78,715	39,930	7,480	50.7
17	The Scofield Company *a*	842,418	57,560	0	6.9
17	Alexander Murdoch *b*	(812,286)	743,610	0	91.5
18	Kelley Bros. Contracting Company	611,382	476,979	0	Finished.
19	Great Lakes Construction Company	891,401	717,970	700	80.6
20A	Houston Barnard	490,592	201,870	5,520	41.1
20B	S. Pearson & Son, Inc	933,194	271,300	12,340	29.1
20C	American Pipe & Construction Co	585,720	400,090	4,200	68.3
20D	American Pipe & Construction Co	2,685,477	89,120	4,200	3.3
21	Lane Brothers Company	1,323,150	576,120	13,590	43.5
22	M. Fitzgerald	117,194	24,660	400	21.0
23	Millard & Lupton Company	1,808,797	854,990	11,980	47.3
24	James D. Sherrill	44,368	5,840	0	13.2
25	Atlantic, Gulf & Pacific Company	1,694,037	1,450,710	5,650	85.6
26	Lake Erie Dredging Company	40,057	35,443	0	Finished.
27	Kinser Construction Company *a*	723,269	378,650	0	Finished.
27A	Holler & Shepard *b*	(449,192)	128,090	3,210	28.5
29	Maryland Dredging & Contr'g Co	674,250	406,600	920	60.2
30	Acme Engr'g & Contracting Co	2,558,955	1,061,690	26,840	41.5
31	Casey & Murray	831,302	707,040	10,860	85.0
32	Penn Bridge Company	46,797	44,375	0	Finished.
33	Penn Bridge Company	199,640	164,550	0	82.5
34	M. Fitzgerald	22,449	22,258	0	Finished.
35	Gilmour-Horton-Allen Company	748,045	520,930	10,350	69.6
36	J. D. Miller	46,800	46,800	0	Finished.
37	Henry P. Burgard	2,366,677	962,830	400	40.7
38	Henry Tosh & Son	16,870	16,287	0	Finished.
39	James Stewart & Company	1,048,674	157,590	11,350	15.1
40	United Engr'g & Contracting Co	2,252,144	1,699,660	83,810	75.5
41	Butler Bros. Construction Company	273,238	241,644	0	Finished.
42	Shanley-Morrissey, Inc	1,047,366	478,670	1,890	45.7
43	M. A. Talbot Company	1,365,876	171,840	3,860	12.6
44	Scott Brothers	1,758,068	725,740	10,790	41.3
45	Scott Brothers	472,802	418,652	0	Finished.
46	Kinser Construction Company	1,291,805	693,270	60	53.5
47	Crowell-Sherman-Stalter Company	1,279,328	793,110	680	62.0
48	Crowell-Sherman-Stalter Company	1,670,695	476,050	90,580	28.5
49	American Pipe & Construction Co	729,000	428,840	43,320	58.8
50	Buffalo Dredging Company	964,884	125,780	2,570	13.1
51	Alto Construction Company	396,671	93,710	2,570	23.6
53	Scott Brothers	167,585	164,576	0	Fin shed.
54	Hunkin-Conkey Construction Co	250,590	94,280	160	37.6
55	Arthur McMullen	945,840	871,090	9,750	92.0
55R	Joseph Kalk & Alfred S. Brown	7,561	5,630	0	74.4
60	Empire Engineering Corporation	1,491,317	1,247,970	15,110	83.6
61	Cleveland & Sons Company	1,088,890	730,640	35,480	67.0
62	I. M. Ludington's Sons, Inc	2,373,126	1,311,040	213,020	55.4
63	H. S. Kerbaugh, Inc	2,341,198	1,243,200	190,500	53.1

Progress of Contract Work—(*Continued.*)

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to May 1, 1912.
		Put under contract*	Done to May 1, 1912.	Done during April, 1912.	
64	Empire Engineering Corporation	$1,355,434	$748,890	$8,050	56.1
66	Empire Engineering Corporation	854,394	703,540	16,960	82.3
67	Larkin & Sangster	1,149,401	545,970	44,380	47.5
68	Shanley-Morrissey, Inc	1,024,282	946,168	0	Finished.
69	I. A. Hodge & Company	240,061	190,930	1,500	79.5
70	Shanley-Morrissey, Inc	779,636	236,240	0	30.3
71	Shanley-Morrissey, Inc	1,561,119	821,960	0	52.7
72	Shanley-Morrissey, Inc	1,221,112	618,900	0	52.3
73	E. M. Graves	518,829	517,223	0	Finished.
75	United Construction Co	42,917	31,540	13,560	73.5
76	The T. A. Gillespie Company	1,512,011	710,780	44,560	46.9
77	The T. A. Gillespie Company	1,677,482	846,920	44,050	50.6
78	Cunningham-Woodard Company	49,026	47,723	0	Finished.
79	Lupfer & Remick	37,480	33,730	0	Finished.
80	Walter Bradley	117,391	108,130	0	92.1
82	Groton Bridge Company	28,841	21,320	120	73.9
85	Lupfer & Remick	13,151	9,550	7,590	72.6
86	Lathrop, Shea & Henwood Company	43,440	4,940	0	11.3
88	Lathrop, Shea & Henwood Company	25,658	0	0	0.0
90	D'Olier Engineering Company	180,318	162,700	1,190	90.3
91	The Hollington Company	42,940	10,430	3,430	24.3
104	R. B. Murdock	39,370	0	0	0.0
105	Skene & Richmond	258,710	0	0	0.0
	Totals	$73,407,262	$43,561,383	$1,032,000	.....

Cayuga and Seneca Canal.†

A	Scott Brothers	$357,627	$130,330	$5,760	36.5
B	Crowell-Sherman-Stalter Co	1,436,597	514,630	48,060	35.8
H	James H. Dawes	205,649	0	0	0.0
	Totals	$1,999,873	$644,940	$53,820	.....

* Includes all alterations in force to date. *a* Suspended by order of the Canal Board. *b* Relet to complete former contracts, contract price not included in total. † Authorized by separate appropriation.

Brief Account of Contract Work for April.

The following pages show what has been done during the month on the several contracts now in force on the Barge canal. The Erie canal contracts are described in order from Waterford west to Buffalo, and the Champlain and Oswego canal contracts follow, in order from south to north, while the Cayuga and Seneca canal contracts are given from east to west.

Erie Canal.

Contract No. 33.— Lock-gates and valves, guard-gates, etc., on Contracts Nos. 2, 10, 11 and 15.

No contract work done.

Contract No. 16.— For eleven steel highway bridges, ten of which are at various points on Contracts Nos. 25 and 27, Champlain canal, and the remaining one on Contract No. 11, Erie canal.

At Smiths Basin bridge, steel was erected, riveted and painted, splice plates reamed and placed, timber framed and laid in floor and coping set. Quantities: Structural steel, 142,520 lbs.; timber, 10,592 ft. B. M.

At Fort Ann bridge steel was painted, lumber placed in floor and coping set. Quantities: Lumber, 15, 124 ft. B. M.

At Brayton's, Dewey's and Comstock bridges, steel work was scraped and painted and coping stone set.

At East street, steel was delivered and the false work set in place.

Contract No. 36.— For constructing sixteen operating winches for movable dams in the Mohawk river.

Contract completed. Final estimates approved by the Canal Board on April 24, 1912.

Contract No. 13.— For three bridge superstructures on Contract No. 12 and two on Contract No. 18.

No contract work done.

Contract No. 2-E.— For completing the construction of the canal from the Mohawk river at Waterford to a point about one-fourth mile above the head of Lock No. 3.

At Lock No. 3, buffer-blocks were fitted for lower gates. Repairs were made to wall at site of old coffer-dam in Champlain canal.

Contract No. 11.— For prism excavation and construction from Contract No. 2 to Mohawk river below Crescent, including Locks Nos. 4, 5 and 6, highway, bridge abutments, guard-gate, masonry, etc.

Work was resumed April 11. Plant was repaired. Concreting began April 20. About 362 cu. yds. were placed, of which 194 cu. yds. completed the floor of Lock No. 5; 135 cu. yds. were placed in south approach wall below Lock No. 6, and 33 cu. yds. in the north retaining wall at Mohawk river. Below Lock No. 4 commenced cleaning up the prism, placing material removed as embankment in north retaining wall. The Bucyrus shovel removed about 435 cu. yds. from prism below Lock No. 6 on north side. The Vulcan shovel removed about 250 cu. yds. from south side of prism west of guard-gate. Material from both shovels was placed in north embankment of Lock No. 6. Some of the embankment placed here was obtained from stored material west of this point. About 2,040 lin. ft. of rock were drilled and 81 sq. ft. were channeled during the month.

Contract No. 14.— For work from Contract No. 11 to a point near Rexford Flats aqueduct, including Lock No. 7 and Dams Nos. 2 and 3; also for constructing Locks Nos. 13, 14 and 15, Dams Nos. 9, 10 and 11, Mindenville retaining dam, etc.

At Dam No. 3, Lock No. 7, Vischer's Ferry, about 800 cu. yds. of material were removed from the prism by a traveler with clam-shell bucket. About the same quantity of embankment was placed at wing and core walls on the south side of the lock. Some 1,800 cu. yds. of spoil were rehandled from outside of the embankment by a tower scraper at the southeast corner of the lock. In the old canal, coffer-dams were built and a timber crib is being constructed.

At Dam No. 9, Lock No. 13, Yosts, flooring was laid on bridge, contact-strips placed on dam gates, steel work painted, bridge anchors concreted, railing fitted, walks laid on lock-gates and needle-beams, etc. Quantities: Lumber, 7,706 ft. B. M.; steel, 55,454 lbs.

At Dam No. 10, Lock No. 14, Canajoharie, tool-box, tank, shelter, etc., were built on the bridge. Flooring was laid, anchors concreted, etc. Quantities: Lumber, 7,706 ft. B. M.

Contract No. 14-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 14 to new burial plots outside the low lines.

No work was done.

Contract No. 20-D.—For dredging Mohawk river channel, constructing stream entrances, etc., between deep water below Rexford Flats aqueduct and center of bridge at Dam No. 9, at Yosts.

The dipper-dredge excavated about 400 cu. yds. from a drainage ditch and built dikes, also removing to spoil about 7,800 cu. yds. from the channel. The hull of the hydraulic dredge, the tug-boat and a large dump-scow were launched during the month and work on them continued. The quarrying and delivery of riprap and paving stones from Tribes Hill for stream entrance work continued. Quantities: Excavation, 8,200 cu. yds.

Contract No. 8.— For constructing Dam No. 4 and Lock No. 8, at Scotia; Dam No. 5 and Lock No. 9, at Rotterdam; Dam No. 6 and Lock No. 10, at Cranesville, all on the Mohawk river.

Contract canceled. Final estimates being prepared.

Contract No. 17.— For constructing Dam No. 7 and Lock No. 11, at Amsterdam, and Dam No. 8 and Lock No. 12, at Tribes Hill.

Final estimates being prepared.

Contract No. 20-C.—For dredging Mohawk river channel, constructing stream entrances, etc., between center of bridge at Dam No. 9, at Yosts, and center of bridge at Dam No. 10, at Canajoharie.

The dipper-dredge began operating, material being placed in scows and towed down the river to deep water along the north bank. This dredge also excavated above Spraker's rift, casting over, but this was stopped until the dam at Yosts is in place. About 4,200 cu. yds. were removed. The hydraulic dredge moved down the river and excavated below grade, to afford room for deposit of coarse material, about 2,000 cu. yds. being placed on

the Kelley area. The dredge then moved further down and began prism excavation, spoiling about 4,052 cu. yds. on the E. Spraker area. Quarrying and delivery of stone for creek entrance work continued. Quantities: Excavation, 8,252 cu. yds.

Contract No. 86.— For the contruction of one span of a highway bridge over the Mohawk river at Canajoharie, to replace two existing spans, which will be removed.

No construction work was done.

Contract No. 20-B— For dredging Mohawk river channel, constructing stream entrances, etc., between the center of bridge at Dam No. 10, at Canajoharie, and the upper miter wall of the new lock at Mindenville.

On April 6 the orange-peel dredge began shaping and rehandling the coarse material along the bank. One dipper-dredge and the disposal boat began operations on April 12. A broken spud compelled the substitution of the other dredge and later the pump on the disposal boat gave out, further delaying operations. Since April 20 work has progressed most of the time, about 15,875 cu. yds. of material being excavated. Some of the coarse material was used for wash wall, the remainder being spoiled on the north side. About 1,004 cu. yds. of wash wall were laid.

Contract No. 20-A.— For dredging Mohawk river channel, etc., between Castle creek and upper miter wall of lock at Little Falls.

High water and silt in the bottom of the cut delayed work during the first part of the month. The steam-shovel excavated from the prism, working in gravel and rock, and depositing material in spoil on south side. The orange-peel bucket machine also began prism excavation, material being drawn by teams to embankment area along the east side of Castle creek, between the old canal and the W. S. R. R. The wash wall section on south side was also graded and completed, using cobblestones taken from excavated material. Work has also progressed on the 12-in. dredge harbored on the Garlock property. General repairs to machinery, painting, assembling and launching pontoons, etc., was also done. Quantities: Excavation, 6,408 cu. yds.; embankment, 472 cu. yds.; wash wall, 131 cu. yds.

Contract No. 31.— For improving the Erie canal at Little Falls, constructing Lock No. 17, and modifying the dam and constructing guard-gates at Rocky Rift.

The opening into the old canal at the west end of Lock No. 17 is completed. Rock excavation near German street is nearly completed except trimming. Material was spoiled in the river west of the Adirondack mill. Excavation, 5,633 cu. yds.

About 764 cu. yds. of embankment and 423 cu. yds. of lining were placed behind retaining walls. Floors were laid on the machinery girders of the lock gates. Stop-logs for power-culverts were finished. Miter-sills for upper gates were placed and 131 needles were finished and stored.

About 234 cu. yds. of concrete were placed in retaining wall east of old lock 39. About 775 cu. yds. of riprap were placed east of old lock 38 and for roadway. The grain elevator east of old lock 37 is being removed.

Contract No. 30.— For dredging channel in Mohawk river and land line from Little Falls to Sterling creek, constructing Lock No. 18 at Jacksonburg, Dam No. 14 and guard-gates at Herkimer, retaining dam at Frankfort, bridges, etc.

At Little Falls rock cutting high water conditions greatly retarded work. The hydraulic dredge *General Herkimer* operated on N. Y. C. R. R. property. A Thew shovel has been building dikes on the Rankin property one-half mile east of Jacksonburg. At Lock No. 18 the pit had not been unwatered up to the close of the month.

Between Jacksonburg and Fort Herkimer Tower No. 1 resumed trimming the south embankment. Traveling derrick 404 shaped the north embankment and traveling derrick 416 excavated from prism. At Fort Herkimer the north bank has been shaped for placing wash wall. Building dry wall has progressed. At Washington street, Herkimer, excavation with clam-shell bucket for concrete wall in front of the steel piling is under way. Material is being spoiled. Tower No. 5 excavated from prism and placed material in embankment area and in spoil.

A power-plant is being erected at the rock cut west of Little Falls.

At Mohawk street, Herkimer, a Thew shovel has been placed for use in excavating for the highway bridge and guard-gate. A temporary road around the bridge and guard-gate is being constructed. Steel piling for use at Dam No. 14 is being delivered.

At Ilion, tower No. 2 constructed hydraulic dikes on released land. This work was delayed by high water.

The 20-in. dredge *DeWitt Clinton*, operating one-half mile east of Frankfort, excavated 62,089 cu. yds. of material from the prism, omitting a section containing material too hard for this method.

The temporary bridge at East Schuyler road has been reconstructed. The derrick sloper resumed trimming prism slopes west of this road. Quantities: Excavation, 67,681 cu. yds.; embankment, 10,234 cu. yds.; dry wall, 247 cu. yds.; wash wall, 515 cu. yds.

Contract No. 29.— For excavating prism from Sterling creek to Oneida-Herkimer county line, constructing lock at Sterling creek, bridges, etc.

At Sterling creek spillway the steam-shovel removed 2,102 cu. yds. of material. Part of this was backfilled at the south lock wall. The remainder was washed for use in concrete. Track was laid for excavating waste-weir channel and for trimming spoil banks at the west end of the contract. Repairs were made and plant distributed.

Contract No. 42.— For prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillway, stream entrances, culverts, etc.

At Park avenue bridge about 38,800 lbs. of steel were placed, another compressor, tank and boiler were installed, and most of the riveting, except on top chords, was completed. At Genesee street the Gas & Electric Co. removed an 8-in. main and laid a temporary line west around the bridge. At the lock, pumps continued to operate until April 7, when the water rose and flooded the pit. Since then the dredge was repaired and pumped out.

Contract No. 43.— For constructing the canal from a point just south of Oriskany road to about 1,500 feet west of Mud creek.

The dredge *Stanwix* removed 20,000 cu. yds. of material from the prism. In Oriskany road bridge 2,240 lbs. of structural steel were placed in the river span and 3, 625 lbs. in the canal span.

Contract No. 44.— For constructing the canal from about 1,500 feet west of Mud creek, west of Rome, to about three miles west of New London, including junction lock, Locks Nos. 21 and 22, bridges, culverts, spillways, stream entrances, etc.

About 22,571 cu. yds. of material were excavated from the prism by tower, shovel and traveling derrick. In Lock No. 21. 5,876 sq. ft. of steel and 960 ft. B. M. wooden sheet-piling were used, and 1,264 lin. ft. of foundation piles driven. In the bridge at the lock, 700 ft. B. M. of sawed lumber were used, 15 cu. yds. of second-class and 67 cu. yds. of reinforced concrete were laid, using 5,475 lbs. of metal in the latter. About 67 sq. yds. of wooden pavement were also laid.

At the junction lock, 431 cu. yds. of second-class concrete were laid. Some 492 lbs. of metal reinforcement were also used.

Contract No. 12.— For excavating prism between Oneida lake and Mosquito Point bridge on Seneca river; constructing Lock No. 23 and other structures.

No construction work done.

Contract No. 22.— Bridges on Contract No. 12.

At Free bridge high water prevented work.

At Bonta's bridge the north superstructure was assembled and riveted.

At Jordan bridge the south end was raised to its proper elevation and the main portion of the abutment poured. Forms for south approach slab were completed.

At Cold Spring and at State Ditch bridges work has not yet started.

Contract No. 46. — For the construction of the canal from Fox Ridge to the southeast corner of the town of Galen, including Lock No. 25, a movable dam at May's Point, bridges, etc.

Repairs to plant and coffer-dams are being made. No construction work was done.

Contract No. 47.— For the construction of the canal from the southeast corner of the town of Galen to a point near the N. Y. C. & H. R. railway crossing at Lyons, including Lock No. 26, a dam across the Clyde river, highway bridge, stream entrance, etc.

About 1,352 cu. yds. of material were excavated for the dam and placed in embankment for lower approach, together with spoil material. About 2,686 cu. yds. of embankment were formed in all. Other work was on repairs and erection of plant.

Contract No. 5-A.— For the completion of Contract No. 5, from Mosquito Point to Campbell's bridge, including construction of Owasco creek entrance, reconstruction of bridge at Mosquito Point and new pier and approaches at Howland island bridge, etc.

Work not yet begun.

Contract No. 48.— For the construction of the canal from a point near the N. Y. C. & H. R. railway crossing at Lyons to a point near the West Shore railway crossing at East Newark, including Locks Nos. 27 and 28-A, dam and power-house, retention dam across Canandaigua outlet, spillway, culverts, highway, bridge, approaches, etc.

The dipper-dredge *Erie* worked all the month in prism at east end of contract, casting over hard material which the hydraulic dredge *Lyons* will rehandle into spoil. At Geneva street 421 cu. yds. of second-class concrete were laid in completing the retaining wall on south side. About 32 cu. yds. of concrete were placed in bridge abutments. In prism between locks the suction dredge *Lyons* removed 153,871 cu. yds. of material, placing it in spoil banks Nos. 1 and 2.

At Lock No. 28-A, 2,086 cu. yds. were excavated, 822 cu. yds. of concrete laid and 468 lin. ft. of foundation piles driven.

In the prism near the Poorhouse bridge the Marion shovel removed 3,787 cu. yds. and the Browning crane 7,765 cu. yds. of material.

Contract No. 76.— For the construction of the canal from a point near the West Shore railway crossing at East Newark to a point about one-half mile east of Port Gibson.

The only work done was by steam-shovels Nos. 20 and 21, at the west end of the contract, which removed 92,265 cu. yds. of material.

Contract No. 77.— For constructing the canal from one-half mile east of Port Gibson to one-half mile west of Palmyra, including Lock No. 29, power-plant, bridges, culverts, etc.

Steam-shovel 22 worked nearly all the month in the big cut, after which it was moved from the cut. The hydraulic dredge *Palmyra* worked east and connected with the big cut April 27. The total excavation was 95,972 cu. yds. At the guard-gate 774 cu. yds. of second-class concrete were laid in the west abutment.

At Galloway's bridge work continued slowly and 164 cu. yds. of second-class concrete were placed in south abutment.

Contract No. 49.— For prism construction from a point about 500 ft. east of Yellow Mills bridge, about one mile west of Palmyra, to the Monroe county line, including Lock No. 30, sluice-gates, highway bridges, culverts, etc.

In the prism at the east end, the McMyler and Lidgerwood excavators took out 22,952 cu. yds. At the west end the suction dredge *Fairport* removed 133,583 cu. yds. At the upper approach of Lock No. 30, 124 cu. yds. of concrete were placed. At Frear's bridge, 1,578 lin. ft. of foundation piles were driven and the work of weighting slopes was completed. About 124 cu. yds. of concrete were laid at this point. At Wayneport bridge the slopes were weighted with lining and the false work for the superstructure erected.

Contract No. 63.— For enlarging present canal and constructing culverts, sluiceways, waste-weir, guard-gates, dock walls, bridges, highway changes, etc., between Wayne-Monroe county line and Kings Bend.

The Lidgerwood excavator resumed prism work, cutting the north slope and placing material in adjacent embankment. The Fogarty excavator worked the last week of the month west of Wiltsie's bridge, placing material in north approach. Five steam-shovels worked most of the month. One borrowed material for embankment back of Irondequoit trough. The other shovel work was practically in prism. Hand excavation and teams were employed at culverts Nos. 28 and 33; Parker street, Cartersville and Monroe avenue bridges; Fairport dock wall and for wash wall at various points.

Concrete was placed in culverts Nos. 28 and 33, Knapp's, Parker street, Cartersville, Mitchell's, and Monroe avenue bridges, Irondequoit trough, Fairport dock wall and Bushnell's Basin guard-gate.

In structural steel work, Bushnell's Basin and Mitchell's bridges are completed and opened to traffic; wooden block paving at Main street, Pittsford, is being placed; Fullam's Basin bridge is assembled ready for riveting; Cartersville guard-gate has been erected, riveted and most of the operating machinery placed.

Several temporary tow-paths of timber have been constructed and the two temporary timber stop-gates are about completed.

Considerable wash wall was built at various places. Puddle material dumped on the slope of Cartersville banks has been trimmed to finished slopes.

Quantities: Excavation, 62,334 cu. yds.; embankment, 39,497 cu. yds.; concrete, 14,868 cu. yds.; dry stone work 2,779 cu. yds.; sawed lumber, 203,970 ft. B. M.; piles, 220 lin. ft.; iron and steel, 465,107 lbs.

Contract No. 23.— For prism excavation between Kings Bend and Genesee river, and construction of Locks Nos. 32 and 33, guard-lock, bridges, culverts, etc.

At Lock No. 33 a steam drainage-pump worked the entire month.

Steam-shovel 2449 began prism excavation on the north side side, 250 cu. yds. being removed. Second-class concrete to the amount of 1,345 cu. yds. was placed in Lock No. 33 and its lower guide wall, and in West Henrietta road bridge abutments and road culvert under north approach.

Clinton avenue bridge was riveted. South avenue and East Henrietta road bridges are being painted. Some bridge coping stones were set and wooden fence painted. The wooden floor of East Henrietta road bridge was placed. The city of Rochester placed a 24-in. cast-iron pipe in hangers under the floor of this bridge and when this is connected to the existing main, the pipe now crossing the prism 11 feet above grade will be removed.

The cableway at Lock No. 32 was dismantled.

Quantities: Sawed lumber, 12,687 ft. B. M.; iron and steel, 21,359 lbs.

Contract No. 21.— For prism excavation and construction of bridge abutments, guard-lock, etc., from the Genesee river west 2.56 miles to a point just west of the N. Y. C. & H. R. railway crossing.

Electric pumps continued operating at Brooks avenue and at Scottsville road. Shovels Nos. 3 and 4 began operating in the rock cut, sending material to spoil banks. About 27,228 cu. yds. were removed. From eleven to fifteen steam-drills worked ahead of the shovels. Four channelers began cutting prism lines. A locomotive crane worked part of the time, digging drainage ditch and in the site of the guard-lock. At the P. R. R. crossing excavation is completed, ready to concrete. At the B. R. & P. R. R. crossing the bridge is riveted.

Contract No. 82.— For furnishing and erecting three steel highway bridge superstructures on Contract No. 21, near Rochester.

The Scottsville road bridge was given a second field coat of paint and a few imperfect rivets in the railing were replaced.

Work on the remaining bridge at Chili road will be delayed several months, because the abutments on Contract No. 21 have not been built.

Contract No. 75.— For construction of three guard-gate superstructures on Contracts Nos. 60, 61 and 64.

The Brockport guard-gate, on Contract No. 61, is riveted and operating machinery is nearly all in place. Concrete counterweights were cast.

The Spencerport guard-gate, on Contract No. 60, is riveted. Towers are being plumbed and operating machinery placed in position.

Quantities: Metal in gates, 200,335 lbs.; concrete in counterweights, 23 cu. yds.

Contract No. 60.— For prism excavation and construction of culverts, bridge structures, etc., between a point 1.75 miles east of South Greece and a point 0.5 mile west of Adams Basin.

Excavating by locomotive crane, teams and by hand and Koppel cars continued during the month at the turning basin, west of bridge No. 95 and for puddle lining east of the same bridge. Considerable trimming of slopes and excavation for wash wall and paving was done. Rock above grade was drilled and blasted. Considerable puddle lining was placed on sides and bottom of prism east of bridge No. 95. About 608 cu. yds. of wash wall were built at various places and some paving and riprap was done at ends of culverts. Temporary timber tow-paths were constructed at bridges Nos. 95 and 100 and at guard-gate. At culvert No. 45 the south extension was uncovered and a concrete jacket placed over it.

Quantities: Excavation, 13,661 cu. yds.; embankment, 5,870 cu. yds.; dry stone work, 608 cu. yds.; sawed lumber, 7,128 ft. B. M.; iron and steel, 1,470 lbs.

Contract No. 61.— For prism excavation and construction of culverts, bridges, waste-weir, etc., between a point 0.5 mile west of Adams Basin and Monroe-Orleans county line.

The three Lidgerwood excavators operated in prism, finishing to grade and placing material in north embankment or spoil back of it. Excavation of rock in prism continued.

At culverts Nos. 57, 58 and 59 concrete work is completed and backfilling nearly completed. At bridge No. 110 the superstructure is nearly assembled and bolted. A temporary timber towpath is being built at the guard-gate.

Quantities: Excavation, 36,899 cu. yds.; embankment, 23,800 cu. yds.; concrete, 265 cu. yds.; iron and steel, 77,165 lbs.

Contract No. 62.— For prism excavation and construction of culverts, bridge substructures, etc., between Orleans-Monroe county line and a point near Eagle Harbor bridge.

Albion section:

Excavation was continued by steam-shovel and traveling derrick east of Hindsburg bridge; by a clam-shell bucket west of culvert No. 71; by an orange-peel bucket west of culvert No. 73; by a McMyler excavator with drag-line east of Transit bridge; by a Bucyrus shovel with drag-line east of culvert No. 73; by clam-shell buckets east of culverts No. 75 and 78; by steam-shovel and train outfit at Albion and by Lidgerwood excavator east of Gaines bridge. Other excavation occurred at culverts Nos. 71, 73, 75, 78, 82 and 83, Eagle Harbor trough, bridge at Main street, Albion, and at Brockville waste-weir.

Embankment was formed by Lidgerwood excavator east of Gaines bridge; by clam-shell buckets east of culverts Nos. 75 and 78 and by the Bucyrus shovel with drag-line east of culvert No. 75.

Concrete was placed at Bidwell's, Hindsburg, Hall's, Brown street and Main street bridges, culverts Nos. 71, 73, 75, 78, 82 and 83, Eagle Harbor trough and waste-weir and Albion vertical walls.

Cast-iron pipe and specials were laid at culverts Nos. 71, 73, 75, 78, 82 and 83.

Structural steel was used at Brailey's and Hall's bridges and at the anchorages of Albion lift-bridge.

Metal reinforcement was placed at Hindsburg and Brockville bridges, Brockville waste-weir, culvert No. 73, Albion lift-bridge and Eagle Harbor trough.

Quantities: Excavation, 97,066 cu. yds.; embankment, 44,621 cu. yds.; concrete, all classes, 4,585 cu. yds.; pipe and specials,

164,220 lbs.; structural steel, 227,162 lbs.; reinforcing metal, 48,012 lbs.

Holley section:

Four steam-shovels excavated 43,930 cu. yds. of material during the month. About 5,454 cu. yds. of embankment were formed in backfill at culvert No. 63, at McGuire's bridge, and in raising embankments at culverts Nos. 66, 67 and 68. About 3,660 cu. yds. of concrete were placed at culvert No. 63 and in Holley trough and waste-weir. About 1,820 cu. yds. of rubble masonry were built at the wall west of Hulberton. About 128,807 lbs. of structural steel were placed in Holley lift-bridge. Some 20,422 lbs. of metal reinforcement were used in floor and side wall of Holley trough.

Contract No. 64.— For improvement from 600 ft. west of Prospect street, Medina, to 100 ft. east of Gasport bridge.

Excavation for prism, wash wall and puddle amounted to 4,181 cu. yds. About 2,774 cu. yds. were grubbed. Some 2,780 cu. yds. of embankment were formed, adjacent to prism and at Watson's bridge. Some 410 cu. yds. of puddle were placed. About 217 cu. yds. of second-class concrete were laid in pier and at Watson's and Middleport weirs. About 420 cu. yds. of wash wall were built. Some 789 lbs. of structural steel and 1,238 lbs. of metal reinforcement were used.

Contract No. 66.— For prism excavation and constructing bridges and approaches, culverts, etc., from 100 ft. east of Gasport bridge to 600 ft. east of Lockport locks.

The total excavation for the month was 19,312 cu. yds. At Gasport a Browning crane with scale buckets and hand labor removed 4,064 cu. yds. from prism. At Millard's bridge two Koppel car outfits and a Browning crane with orange-peel bucket removed 5,289 cu. yds. from prism and also 700 cu. yds. from puddle notch. At culvert No. 120 on berme side 454 cu. yds. were removed from the puddle notch and about 752 cu. yds. of embankment were placed. At Young's bridge a Browning crane with scale buckets and hand labor removed 3,268 cu. yds. from prism. Between Lake avenue and Exchange street the Marion shovel with train outfit supplemented by hand labor removed 6,292 cu. yds. from prism. At the west end of the contract some trimming of prism was done by hand and at Gasport 192 cu. yds. of silt were removed.

At Millard's bridge 1,572 cu. yds. of puddle were placed in bottom and berme slope, and 91 cu. yds. were placed at culvert No. 120. About 39 cu. yds. of concrete were laid at Lockport waste-weir. East of Chapel street on the tow-path side, 293 Lackawanna steel sheet-piles were driven.

Contract No. 67.— For construction of Locks Nos. 34 and 35 and approaches, etc., at Lockport.

Total excavation for the month amounted to 7,929 cu. yds. A derrick and train with hand labor removed 997 cu. yds. of earth and rock from site of lower guide wall and Lock No. 34, part of the material being used to backfill the lock. About 600 cu. yds. of rock were taken from the outer miter-sill at upper end of Lock No. 35 and from prism at tunnel portal by hand labor, one derrick and one train working the latter half of the month. The 70-ton Bucyrus shovel and 5 trains, working the first two weeks, excavated 6,332 cu. yds. of rock from the prism west of Lock No. 35, after which the shovel was laid up for the season of navigation.

Sections 17, 18, 19, part of 20 and the needle-sill of Lock No. 34 were completed with the placing of 1,632 cu. yds. of concrete, and the lower buffer-beam was set in position so that the needle-dam may be used to keep water out of the lock during the summer. About 120 cu. yds. of concrete were placed in piers for lower guide wall and 107 cu. yds. in the outer sill of Lock No. 35.

At Main street bridge 166,723 lbs. of structural steel were placed and riveted, practically completing the portion of the bridge from arch 10 to 30. Six cu. yds. of coping were put on the abutments and 20,864 ft. B. M. of creosoted lumber were laid in floor. Erection of steel work of Transit street bridge was started and 153,857 lbs. of structural steel were placed during the last two weeks of the month.

Work on the upper gates at Lock No. 35 progressed so as to assure the closing of these gates in time to admit water to the upper level. One steel valve was placed in the north wall at the upper end of Lock No. 35.

Contract No. 40.— For constructing the canal, culvert entrances, guard-gates, stream entrances, bridges, etc., from the Lockport locks to Sulphur Springs guard-lock.

The total excavation for the month was 64,403 cu. yds. The Bucyrus shovel and three trains near Prospect street excavated

6,628 cu. yds. of rock. Shovel No. 15 and double-boom crane near Summit street removed 17,655 cu. yds. of rock. At Hinman's bridge Marion shovel and cableway for 4 days and after that hand labor, removed 1,580 cu. yds. of rock. The cantilever removed 20,579 cu. yds. of earth west of Riley's bridge. The Browning excavator and tipple took out 9,617 cu. yds. of earth west of Hawley's bridge. Shovel No. 16 and 3 trains removed 8,344 cu. yds. of rock near the guard-lock.

About 723 cu. yds. of concrete were placed, 340 cu. yds. of which were in the wall at Hinman's bridge and 383 cu. yds. in the wall at the guard-lock. Holes were drilled and dowels placed in the rock at the latter point. About 9,352 cu. yds. of wash wall and riprap were built at various points.

At Summit street bridge 2,680 lbs. of steel were placed and 1,700 ft. B. M. of sawed lumber laid in flooring. Some 258 sq. yds. of wooden pavement were also placed.

In the guard-gate 96,920 lbs. of metal were used, completing erection of the three towers. Metal for the gates was received.

Contract No. 19.— For prism excavation, rebuilding bridges, constructing masonry culvert, concrete-capped pile docking, etc., between Sulphur Springs guard-lock and mouth of Ellicott creek.

The total excavation for the month was 4,035 cu. yds., of which 3,971 cu. yds. were removed by the hydraulic dredge *Niagara* west of Bush's. The remainder was by hand labor from ditches. The dipper-dredge *Buffalo* began work April 15 and cast over about 10,000 cu. yds. west of Three-Mile bend. This will be rehandled by the hydraulic dredge. The clam-shell dredge *Lawton* was employed in removing coffer-dam at McDonald's culvert. Piles were driven for bents at Tonawanda creek tow-path bridge. General repairs were continued on the tug *Ciscoe,* mud-scows, etc., at Tonawanda dry-dock.

Two slides occurred. At one, about 150 cu. yds. of tow-path moved into the canal. At the other, about 250 lin. ft. of Martinsville dock gave way.

Champlain Canal.

Contract No. 70.— For dredging a channel in the Hudson river from outlet of Barge canal at Waterford to Lock No. 1.

No contract work done.

Contract No. 71.— For constructing Lock No. 1 and Dam No. 1, above Waterford, and dredging Hudson river from Lock No. 1 to lower Mechanicville lock.

The only construction work was completing the trimming of the gate-posts of the lock. Work on the coffer-dams is prevented by high water.

Contract No. 69.— For constructing Lock No. 2, at lower Mechanicville.

High water conditions have continued, delaying most of the work. The work of painting the bridge and laying the floor was practically completed. Some preparations were made for erecting the lower gates as soon as the water stage permits.

Contract No. 72.— For dredging Hudson river from lower Mechanicville to Stillwater.

No construction and only a limited amount of repair work was in progress. No preparatory work is being done. The high water stage in the river has prevented work on the coffer-dams. The dredging work in the vicinity is already a month later than last year in getting under way.

Contract No. 88.—For the construction of a steel highway bridge at Schuylerville, within the limits of Contract No. 73.

The contractors have been on the ground to ascertain conditions and plan the construction of the bridge. A small amount of materials for caissons was received and unloaded.

Contract No. 1.— For dredging Hudson river from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; constructing Crocker's Reef dam and approaches to "Land Line," etc.

Work closed down indefinitely.

Contract No. 24.— For constructing guard-gate at Crocker's Reef.

No contract work done.

Contract No. 54.— For constructing Lock No. 7, at Fort Edward.

The core wall was backfilled with 405 cu. yds. of spoil. The new concrete plant is nearly completed. Conveyor spouts have been received. Steel for lock-gates and buffer-beams has been delivered and most of it drawn to the site. The water in the river is still above the coffer-dam.

Contract No. 27-A.— For completing the construction of the canal between the Hudson river at Fort Edward and the south end of Contract No. 25, at Dunhams Basin road.

High water prevented work during the early part of the month. About 5,624 cu. yds. were excavated from spoil banks on both sides of Bond creek diversion channel. In other excavation about 2,656 cu. yds. were removed, of which 377 cu. yds. were from power-plant, 1,297 cu. yds. from prism north and south of Argyle street, 554 cu. yds. from dive-culvert and 428 cu. yds. from ditch east of canal and south of this culvert. About 5,397 ft. B. M. of sheeting and bracing were used, of which 3,360 ft. were at power-plant and 2,037 ft. at east pier of Broadway bridge. Some 336 cu. yds. of embankment were placed back of the southwest approach wall of Lock No. 8, 610 cu. yds. in the west approach of East street bridge, 144 cu. yds. on the west side of the prism south of East street, and 500 cu. yds. around the east abutment and pier of Broadway bridge. At the power-plant at Lock No. 8, 13 15-ft. and 1 20-ft. piles were driven. About 3,024 ft. B. M. of sheet-piling were also driven in front of the power plant. About 5 cu. yds. of concrete were placed in abutments of East street bridge over Bond creek, completing that structure. Miter-gates are being framed for junction lock.

Contract No. 25.— For prism excavation between a point 0.6 mile north of Comstock post-office and highway crossing at Dunhams Basin; constructing Lock No. 9, spillways, power-plant, etc.

General repairs were made to boats and machinery. The dredge *Champlain* excavated 17,645 cu. yds. from the two miles of prism north of Dunhams Basin. The dipper-dredge took out 170 cu. yds. at Parish bridge. About 90 cu. yds. were borrowed and placed in west embankment at Fort Ann bridge. Some 176 cu. yds. of lining were placed, mostly in west approach of Comstock bridge. About 630 cu. yds. of wash wall were laid at Comstock and one-half mile north of Smiths Basin. Some 32 sq. yds. of paving were laid on the east side of Dewey's bridge.

Oswego Canal.

Contract No. 39.— For dredging channel in Oswego river, constructing stream entrances, excavating through Hinmansville cut-off, etc., between Three River Point and Fulton, except portion covered by Contract No. 53.

Dredging was resumed, 13,674 cu. yds. of material being removed.

Contract No. 85.— For constructing a steel bridge over the lock at Phoenix.

About 82,281 lbs. of steel were placed in bridge and tower during the month and 5,339 lbs. of machinery were placed.

Contract No. 80.— For constructing a concrete dam across the Oswego river at Phoenix.

No contract work was done.

Contract No. 104.— For the construction of a reinforced concrete arch bridge over the Barge canal at Broadway, Fulton. Contract recently awarded. Work not yet begun.

Contract No. 10-A.—For completing the construction of the canal, raising the upper dam, etc., from Broadway bridge, Fulton, south to Contract No. 39.

About 289 cu. yds. of material were excavated, of which 89 cu. yds. were from spoil banks.

Contract No. 10-B.— For completing the construction of the canal from the upper end of Lock No. 2, Fulton, north to Contract No. 37. Work not yet begun.

Contract No. 79.— For the construction of two spans of a highway bridge over the river at Bridge street, in connection with six other similar spans to be constructed by the city of Oswego.

Final estimates before Canal Board.

Contract No. 37.— For dredging a channel in Oswego river, constructing Locks Nos. 5 and 6, dams, bulkheads and other structures, and the removal of Battle Island and High dams, between Contract No. 10, at Fulton, and Contract No. 35, at Oswego.

A drainage trench was excavated, removing 122 cu. yds. of material, forming 23 cu. yds. of embankment, using 3,100 ft. B. M. of sheeting and bracing and laying 48 lin. ft. of 18-in. vitrified pipe.

On road "A," adjacent, 19 cu. yds. were excavated in drainage trench and at culvert and 17 cu. yds. of concrete were laid at the latter. About 1,109 cu. yds. of embankment were formed.

Contract No. 35.— For prism excavation and constructing Locks Nos. 7 and 8, bulkheads, culverts, spillways, etc., between a point one-half mile above Utica street bridge and harbor line north of Bridge street, at Oswego.

The total excavation was 5,241 cu. yds. of which 292 cu. yds. came from the east lower approach wall of Lock No. 7, 1,119 cu. yds. from the east wall and 3,830 cu. yds. from the prism. In the hydraulic canal bulkhead 1,347 ft. B. M. of sawed lumber were used. In the east upper approach wall of Lock No. 8, 723 ft. B. M. of white oak lumber were used. About 524 cu. yds. of second-class concrete were laid, of which 367 cu. yds. were in the east wall and the remainder in the east lower approach wall of Lock No. 7. In the reinforced span of the bridge pier at this lock, 32 cu. yds. of concrete and 3,177 lbs. of metal were used. Twelve fender fastenings were placed on the east wall.

Cayuga and Seneca Canal.

Contract A.—For constructing Lock No. 1 and Dam No. 1, near Cayuga.

Excavator No. 1 operated in the north end of the lock, material being spoiled by cars along the tow-path. Excavator No. 2 worked about half the month along the chamber of the lock, spoiling directly in the bank west of the lock. A steam-drill operated in the bottom of the lock. The east side of the excavation was sloped by hand labor. Sheeting and bracing were placed in the northwest approach wall. A trestle was erected over the east wall for distributing concrete.

Quantities: Excavation, 2,505 cu. yds.; sheeting and bracing, 9,916 ft. B. M.; foundation piles, 89 lin. ft.; metal in lock gates, 3,165 lbs.

Contract B.— For excavating a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from

Cayuga lake to Seneca Falls and from Waterloo to deep water in Seneca lake.

The dredge *Clyde* removed 228,842 cu. yds. of material from the prism during the month, working north. Repairs were made to Free bridge. Dikes were constructed and repaired. The water in the river has been high throughout the month.

Contract H.— For excavating a channel in Cayuga lake inlet at Ithaca from a point about 300 feet north of Cascadilla street to deep water in Cayuga lake. Contract recently awarded. Work not yet begun.

WATER-SUPPLY.

Contract No. 50.— For constructing dam, waste-gates and spillway across West Canada creek at Hinckley.

Construction work was resumed April 9. Back of north abutment grubbing and excavation for east wing was done and rock drilling began. The McMyler excavator has completed the removal of muck from along the east side of the core wall and is now working with traveling derricks on excavation of core wall trench. The steam-shovel has resumed excavation of material for embankment. The concrete plant is being remodeled.

Quantities: Excavation, 4,618 cu. yds.; sheeting and bracing, 8,693 ft. B. M.; embankment, 477 cu. yds.

Contract No. 51.— For constructing a canal feeder from Trenton Falls on West Canada creek to Nine-Mile creek below South Trenton, with gate-house, culverts, highway, etc.

Excavation of feeder prism has continued with Browning shovel. Some material was placed within embankment lines. A drainage ditch is also being excavated. At the heavy cut, Browning excavator, model "K," removed about 800 cu. yds. Test-holes are being drilled along the center line by a well-drill. Traveling derricks for prism excavation are being erected.

Quantities: Excavation, 5,277 cu. yds.; embankment, 200 cu. yds.

Contract No. 55.— For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black River canal, with four locks and aqueduct over Mohawk river, highway change, bridges, etc.

Construction was resumed on April 8. The 30-in. feed-pipe for the Black River canal has been laid, but some backfilling remains. The junction of the old and new canals above Lock No. 7 is being made and the sill of the upper gate of lock 7 has been finished to grade.

Quantities: Excavation, 5,264 cu. yds.; sheeting and bracing, 4,279 ft. B. M.; embankment, 513 cu. yds.; concrete, 90 cu. yds.; cast-iron pipe and specials, 211,721 lbs.

No work was done on the adjacent highways.

Contract No. 55-R.—For the removal of bodies from cemeteries located within the flooded area of Contract No. 55, Delta reservoir, to a new cemetery outside the flow lines.

No contract work was done.

Power-Supply.

Contract No. 91.— For building and equipping a hydro-electric power-plant on the Erie canal near the east end of Crescent dam.

All sections of the penstock have been lowered into place and partly riveted. The wheel-cases and butterfly-valves for all three units have been placed in position and bolted. The embankment at the south end of the structure is completed. About 137 cu. yds. of second-class concrete were placed, completing the south retaining wall and bringing the whole substructure up to the elevation of the top of the water-table, with the exception of a small section where the penstock enters. The turbine machinery and valves have been estimated as 25 per cent completed.

Contract No. 90.— For constructing hydro-electric power-plants at Baldwinsville on the Erie canal and at Smiths, Comstock and Whitehall on the Champlain canal. Also for constructing equipment for operating and lighting the following locks: No. 24, Erie canal; Nos. 1, 2, 7 and 8, Oswego canal; Nos. 9, 11 and 12, Champlain canal.

On the Champlain canal:

At Lock No. 9, machinery was grouted in and general work done.

At Lock No. 11, adjusting and operating governors, generators and miscellaneous electrical equipment.

At Lock No. 12, all concrete was finished. Adjusting and operating governors, generators, valves and gates and miscellaneous equipment.

On the Oswego canal:

At Lock No. 7, 541 lbs. of metal ducts were placed and 1,500 lbs. of lead-covered, rubber-insulated conductors laid.

At Lock No. 8, about 334 lbs. of metal ducts were placed.

Progress of Plans Being Prepared.

The following pages contain detailed accounts of the plans in process of preparation at the main and residency offices, showing progress up to the first of May. An order according to location is followed, as explained in the account of contract work for the month.

Erie Canal.

Contract No. 74.— For dredging Mohawk river from Hudson river to Contract No. 2-E. Plans held for further consideration.

Contract No. 18-A.— For completing the construction of the canal from Mindenville to Castle creek. Plans 83 per cent. completed.

Contract No. 57.— Syracuse harbor. Plans completed, but held for further consideration.

Contract No. 22-A.— For constructing a new substructure, approach spans and approaches for a bridge over the Erie canal at Weedsport. Plans completed.

Contract No. 84.— For the construction of two steel lift bridges at Clyde, within the limits of Contract No. 47. Work on plans suspended, pending an investigation as to elimination of grade crossing.

Contract No. 59.— For constructing a movable dam in the Genesee river at Rochester. Plans 90 per cent completed.

Contract No. 106.— For the construction of four lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Exchange street, Lockport; Middleport; Prospect street, Medina; Main street, Brockport. Plans 96 per cent completed.

Contract No. 65.— For work from the west end of Contract No. 9, at a point near Beal's bridge, to the east end of Contract No. 64, at a point 600 feet west of Prospect street, Medina, including Oak Orchard creek crossing. Plans are being prepared for a change of route, following practically the line of the present canal and crossing Oak Orchard creek at the site of the present aqueduct. Plans 50 per cent completed.

Champlain Canal.

Contract No. 56.— Glens Falls feeder. Plans 85 per cent completed.

Cayuga and Seneca Canal.

The contracts on this canal may be rearranged. For the present the old order is retained.

Contract C.— For constructing Lock No. 2 and Dam No. 2, near Demont's bridge. Plans under revision.

Contract D.— For constructing Lock No. 3 and excavating prism east of Seneca Falls. Plans under revision.

Contract E.— For constructing Lock No. 4 at Seneca Falls, three highway bridges, etc. Plans 70 per cent completed.

Contract G.— For dredging a channel in the Seneca river from Lock No. 4, at Seneca Falls, to Contract B, at Waterloo. Plans 50 per cent completed.

Contract F.— For constructing Lock No. 5 and dam at Waterloo. Plans 55 per cent completed.

Contract I.— For improving the canal from deep water in Seneca lake to Montour Falls, about 2.75 miles. Plans under way.

Contract J.— For improving Glen creek from the highway bridge in the village of Watkins to the canal improvement. Plans under way.

POWER-SUPPLY.

Contract No. 92.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 2, 3, 4, 5, 6 and 7, on the Erie canal, and Locks Nos. 6 and 8, on the Champlain canal. Plans 95 per cent completed..

Plans Before Canal Board.

Contract No. 8-A.— For constructing Dam No. 4 and Lock No. 8 at Scotia and other incidental work pertaining to the completion of the locks at Rotterdam and Cranesville. Plans approved by the Canal Board, May 8, 1912.

Contract No. 101.— For the construction of a steel highway bridge superstructure at Three River Point. Plans before Canal Board.

Contract No. 103.— For the construction of a reinforced concrete arch bridge over part of the Oswego river at Phoenix. Plans before Canal Board.

Contract No. 90-A.— For constructing hydro-electric power-plants, sub-stations and equipments to complete installations at Locks Nos. 1, 2, 7 and 8, Oswego canal. Plans approved by Canal Board, May 8, 1912.

Contract Advertised.

Contract No. 89.— For the construction of five superstructures and one substructure for highway bridges between Lyons and Palmyra on Contracts Nos. 48, 76 and 77. Advertised; bids opened May 21, 1912.

Award of Contract.

Contract No. 105.— For the construction of five lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Union street, Spencerport; Washington street, Adams Basin; Park avenue, Brockport; Hulberton; Gasport. Bids opened April 9, 1912. Five bids were received, the lowest of which was by Skene & Richmond, of Louisa, Ky., to whom it was subsequently awarded at $258,710. The detailed bids appear elsewhere.

RECAPITULATION — PROGRESS ON PLANS.

Contract No.	DESCRIPTION.	Canal.	Progress on plans.
8A	Supplemental to Contract 8	Erie	Before Canal Board.
18A	Mindenville to Castle creek	Erie	83 per cent completed.
22A	Bridge approaches, etc., at Weedsport	Erie	Completed.
56	Glens Falls feeder	Champlain	85 per cent completed.
57	Syracuse harbor	Erie	Held for consideration.
59	Rochester harbor dam	Erie	90 per cent completed.
65	Canal and aqueduct at Medina	Erie	50 per cent completed.
74	Dredging Hudson river to Contract 2-E	Erie	Under consideration.
84	Two lift-bridges at Clyde	Erie	Suspended.
89	Bridges on Contracts 48, 76 and 77	Erie	Advertised.
90A	Supplemental to Contract 90	Oswego	Before Canal Board.
92	Power-house and lock equipments	Erie, Champlain	95 per cent completed.
101	Bridge at Three River Point	Erie	Before Canal Board.
103	Bridge at Phoenix	Oswego	Before Canal Board.
105	Five lift-bridges between Rochester and Lockport	Erie	Awarded.
106	Bridges on Contracts 61, 64, 65 and 67	Erie	96 per cent completed.
C	Lock 2, near Demont's bridge	Cayuga and Seneca	Under revision.
D	Lock 3 and prism, east of Seneca Falls	Cayuga and Seneca	Under revision.
E	Lock 4 at Seneca Falls	Cayuga and Seneca	70 per cent completed.
F	Lock 5 and dam at Waterloo	Cayuga and Seneca	55 per cent completed.
G	Dredging, Seneca Falls to Waterloo	Cayuga and Seneca	50 per cent completed.
I	Watkins to Montour Falls	Cayuga and Seneca	Under way.
J	Glen creek at Watkins	Cayuga and Seneca	Under way.

BIDS FOR CONTRACT No. 105.

ITEMS.	Measure.	Quantities	ENGINEER'S ESTIMATE.		OSWEGO BRIDGE CO., OSWEGO, N. Y.		LUPFER & REMICK, BUFFALO, N. Y.		LARKIN & SANGSTER, ASHLEY BLDG., LOCKPORT, N. Y.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.
Coffer-dams, pumping, bailing and draining	lump sum		$3,000 00	$3,000 00	$3,500 00	$3,500 00	$3,600 00	$3,600 00	$3,500 00	$3,500 00
Excavation	cu. yd	44,000	80	35,200 00	95	41,800 00	65	28,600 00	90	39,600 00
Sheeting and bracing	M. ft. B. M.	13	50 00	650 00	50 00	650 00	50 00	650 00	50 00	650 00
Forming embankment	cu. yd	4,000	25	1,000 00	25	1,000 00	25	1,000 00	25	1,000 00
Lining	"	1,300	1 50	1,950 00	1 50	1,950 00	1 50	1,950 00	1 50	1,950 00
Sawed lumber, yellow pine	M. ft. B. M.	96	60 00	5,760 00	60 00	5,760 00	70 00	6,720 00	60 00	5,760 00
Second-class concrete	cu. yd	3,200	8 00	25,600 00	8 00	25,600 00	9 00	28,800 00	8 50	27,200 00
Reinforced concrete	"	4,400	12 00	52,800 00	12 00	52,800 00	13 50	59,400 00	12 00	52,800 00
Wash wall	"	500	2 00	1,000 00	2 00	1,000 00	2 00	1,000 00	2 00	1,000 00
Cobblestone paving	sq. yd	560	1 25	700 00	1 25	700 00	1 25	700 00	1 25	700 00
Cast iron pipe and specials	lb	20,000	03	600 00	03	600 00	03	600 00	03½	700 00
Structural steel	"	1,470,000	04½	66,150 00	05½	77,175 00	.046	67,620 00	04½	71,662 50
Machinery	"	200,000	12	24,000 00	12	24,000 00	12	24,000 00	12	24,000 00
Metal reinforcement	"	282,000	03¼	9,870 00	03	8,460 00	04	11,280 00	.035	9,870 00
Portland cement sidewalk	sq. ft	1,680	25	420 00	25	420 00	25	420 00	25	420 00
Brick pavement	sq. yd	230	2 00	460 00	2 00	460 00	2 00	460 00	2 00	460 00
Wooden fence	lin ft	600	20	120 00	20	120 00	20	120 00	20	120 00
Lattice railing	"	2,100	1 80	3,780 00	1 80	3,780 00	1 80	3,780 00	2 15	4,515 00
Drilling holes in rock and existing masonry	"	500	80	400 00	80	400 00	80 00	400 00	80	400 00
Electrical equipment	each	5	2,000 00	10,000 00	2,000 00	10,000 00	2,000 00	10,000 00	2,200 00	11,000 00
Electric pumps	"	5	450 00	2,250 00	450 00	2,250 00	450 00	2,250 00	500 00	2,500 00
Operator's cabin	"	5	400 00	2,000 00	400 00	2,000 00	440 00	2,200 00	475 00	2,375 00
Maintaining navigation	lump sum	1		2,500 00	2,500 00	2,500 00	3,000 00	3,000 00	3,000 00	3,000 00
Maintaining highway traffic	"	1		3,000 00	3,000 00	3,000 00	3,500 00	3,500 00	3,500 00	3,500 00
				$253,210 00		$269,925 00		$262,050 00		$268,682 50
Deduct for bridge superstructures				200 00		200 00		200 00		200 00
Total				$253,010 00		$269,725 00		$261,850 00		$268,482 50

BIDS FOR CONTRACT No. 105.

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		BARRALLY & INGERSOLL, ROCHESTER. N. Y.		SKENE & RICHMOND, LOUISA, KY.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.
Coffer-dams, pumping, bailing and draining	lump sum		$3,000 00	$3,000 00	$3,600 00	$3,600 00	$3,000 00	$3,000 00
Excavation	cu. yd	44,000	80	35,200 00	96	42,240 00	92	40,480 00
Sheeting and bracing	M. ft. B. M	13	50 00	650 00	50 00	650 00	50 00	650 00
Forming embankment	cu. yd	4,000	25	1,000 00	25	1,000 00	25	1,000 00
Lining	"	1,300	1 50	1,950 00	1 50	1,950 00	1 50	1,950 00
Sawed lumber, yellow pine	M. ft. B. M.	96	60 00	5,760 00	72 00	6,912 00	60 00	5,760 00
Second-class concrete	cu. yd	3,200	8 00	25,600 00	8 00	25,600 00	8 00	25,600 00
Reinforced concrete	"	4,400	12 00	52,800 00	12 00	52,800 00	12 00	52,800 00
Wash wall	"	500	2 00	1,000 00	2 00	1,000 00	2 00	1,000 00
Cobblestone paving	sq. yd	560	1 25	700 00	1 25	700 00	1 25	700 00
Cast iron pipe and specials	lb	20,000	03	600 00	03	600 00	03	600 00
Structural steel	"	1,470,000	04½	66,150 00	054	79,380 00	045	66,150 00
Machinery	"	200,000	12	24,000 00	13	26,000 00	125	25,000 00
Metal reinforcement	"	282,000	03½	9,870 00	035	9,870 00	03¼	9,165 00
Portland cement sidewalk	sq. ft	1,680	25	420 00	25	420 00	25	420 00
Brick pavement	sq. yd	230	2 00	460 00	2 00	460 00	2 00	360 00
Wooden fence	lin ft	600	20	120 00	20	120 00	20	120 00
Lattice railing	"	2,100	1 80	3,780 00	1 80	3,780 00	1 80	3,780 00
Drilling holes in rock and existing masonry	"	500	80	400 00	80	400 00	80	400 00
Electrical equipment	each	5	2,000 00	10,000 00	2,000 00	10,000 00	2,000 00	10,000 00
Electric pumps	"	5	450 00	2,250 00	450 00	2,250 00	450 00	2,250 00
Operator's cabin	"	5	400 00	2,000 00	400 00	2,000 00	425 00	2,125 00
Maintaining navigation	lump sum	1		2,500 00	3,000 00	3,000 00	2,500 00	2,500 00
Maintaining highway traffic	"	1		3,000 00	3,600 00	3,600 00	3,000 00	3,000 00
				$253,210 00		$278,332 00		$258,910 00
Deduct for bridge superstructures				200 00		200 00		200 00
Total				$253,010 00		$278,132 00		$258,710 00

List of Barge Canal Contractors, with their Addresses.

Contract No.	NAME.	Address.
1....	Empire Engineering Corporation.....	60 Wall street, New York, N. Y.
2-E..	Holler & Shepard.....	224 E. & B. building, Rochester, N. Y.
5-A..	James Stewart & Co.....	30 Church street, New York, N. Y.
10-A..	T. A. Gillespie Co.....	50 Church st., New York, N.Y. (Newark, N.Y.)
10-B..	Oswego Construction Co., Inc.....	11 First street, Fulton, N. Y.
11....	Fort Orange Construction Co.....	112 State street, Albany, N. Y.
12....	James Stewart & Co.....	30 Church street, New York, N. Y.
13....	Penn Bridge Company.....	Beaver Falls, Pa.
14....	Acme Engineering & Contracting Co...	Manion building, Herkimer, N. Y.
14-R..	Thomas F. Riley.....	42 Third street, Troy, N. Y.
16....	United Construction Co.....	467 Broadway, Albany, N. Y.
17....	Alexander Murdock.....	Fidelity Building, Baltimore, Md.
19....	Great Lakes Construction Co.....	Chamber of Commerce building, Buffalo, N. Y.
20-A..	Houston Barnard.....	853 Powers building, Rochester, N. Y.
20-B..	S. Pearson & Son, Inc.....	507 Fifth avenue, New York, N. Y.
20-C..	American Pipe & Construction Co.....	112 North Broad street, Philadelphia, Pa.
20-D.	American Pipe & Construction Co.....	112 North Broad street, Philadelphia, Pa.
21....	Lane Bros. Co.....	Alta Vista, Va. (104 Cutler building, Rochester, N. Y.)
22....	M. Fitzgerald.....	Hoosick Falls, N. Y.
23....	Millard & Lupton Co.....	Allegany avenue and Tulip street, Phila., Pa.
24....	James D. Sherrill.....	Hudson Falls, N. Y.
25....	Atlantic, Gulf & Pacific Co.....	Park Row building, New York, N. Y.
27-A..	Holler & Shepard.....	224 E. & B. building, Rochester, N. Y.
29....	Maryland Dredging & Contracting Co.	Fidelity building, Baltimore, Md.
30....	Acme Engineering & Contracting Co...	Manion building, Herkimer, N. Y.
31....	Casey & Murray.....	320-321 Cutler building, Rochester, N. Y.
33....	Penn Bridge Company.....	Beaver Falls, Pa.
35....	Gilmour-Horton-Allen Co.....	Hudson Falls, N. Y.
36....	J. D. Miller.....	39 Cortlandt street, New York, N. Y.
37....	Henry P. Burgard.....	275 Lathrope street, Buffalo, N. Y.
39....	James Stewart & Co.....	30 Church street, New York, N. Y.
40....	United Engineering & Contracting Co..	17 West 42d street, New York, N. Y.
42....	Shanley-Morrissey, Inc.....	527 Fifth avenue, New York, N. Y. (65 South Main street, Mechanicville, N. Y.).
43....	M. A. Talbot Co.....	Stanwix Hall, Rome, N. Y.
44....	Scott Bros.....	Empire block, Rome, N. Y.
46....	Kinser Construction Co.....	Montezuma, N. Y.
47....	Crowell-Sherman-Stalter Co.....	Lyons, N. Y.
48....	Crowell-Sherman-Stalter Co.....	Lyons, N. Y.
49....	American Pipe & Construction Co.....	112 North Broad street, Philadelphia, Pa.
50....	Buffalo Dredging Co.....	1104 D. S. Morgan building, Buffalo, N. Y.
51....	Alto Construction Co.....	Holland Patent, N. Y.
54....	Hunkin-Conkey Construction Co.....	Cleveland, Ohio.
55....	Arthur McMullen.....	Singer building, New York, N. Y.
55-R..	Joseph Kalk & Alfred S. Brown.....	Taberg, N. Y.
60....	Empire Engineering Corporation.....	60 Wall street, New York, N. Y.
61....	Cleveland & Sons Co.....	Brockport, N. Y.
62....	I. M. Ludington's Sons, Inc.....	128 Powers building, Rochester, N. Y.
63....	H. S. Kerbaugh, Inc.....	922 Arcade building, Philadelphia, Pa.
64....	Empire Engineering Corporation.....	60 Wall street, New York, N. Y.
66....	Empire Engineering Corporation.....	60 Wall street, New York, N. Y.
67....	Larkin & Sangster.....	Ashley building, Lockport, N. Y.
69....	I. A. Hodge & Co.....	504 Kirk building, Syracuse, N. Y.
70....	Shanley-Morrissey, Inc.....	527 Fifth avenue, New York, N. Y. (65 South Main street, Mechanicville, N. Y.).
71....	Shanley-Morrissey, Inc.....	527 Fifth avenue, New York, N. Y. (65 South Main street, Mechanicville, N. Y.).
72....	Shanley-Morrissey, Inc.....	527 Fifth avenue, New York, N. Y. (65 South Main street, Mechanicville, N. Y.).
75....	United Construction Co.....	467 Broadway, Albany, N. Y.
76....	T. A. Gillespie Co.....	50 Church street, New York, N. Y. (Newark, N. Y.).
77....	T. A. Gillespie Co.....	50 Church street, New York, N. Y. (Newark, N. Y.).
80....	Walter Bradley.....	Fulton, N. Y.
82....	Groton Bridge Co.....	Groton, N. Y.
85....	Lupfer & Remick.....	590 Ellicott square, Buffalo, N. Y.
86....	Lathrop, Shea & Henwood Co.....	324 Ellicott square, Buffalo, N. Y.
88....	Lathrop, Shea & Henwood Co.....	324 Ellicott square, Buffalo, N. Y.
90....	D'Olier Engineering Co.....	Morris building, Philadelphia, Pa.
91....	The Hollington Co.....	Stoll building, Broadway and River street, Troy, N. Y.
104....	R. B. Murdock.....	142 Arcade street, Crown Point, N. Y.
105....	Skene & Richmond.....	Louisa, Ky.
A.....	Scott Bros.....	Empire block, Rome, N. Y.
B.....	Crowell-Sherman-Stalter Co.....	Lyons, N. Y.
H.....	James H. Dawes.....	112 North Broad street, Philadelphia, Pa.

SEP 25 1912

HARVARD UNIVERSITY ENGINEERING LIBRARY

JUNE, 1912

Barge Canal Bulletin

Series V No. 6

DEPARTMENT OF

THE STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
ALEXANDER E. KASTL, Special Deputy State Engineer

ISSUED MONTHLY UNDER THE AUTHORITY OF THE STATE ENGINEER, BY THE BUREAU OF PUBLICATION AND REPORTS, DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR

CONTENTS

Progress of Contract Work..... 162
Brief Account of Contract Work for May..... 163
Progress of Plans Being Prepared..... 187
Plans before Canal Board..... 189
Contracts Advertised..... 190
Award of Contract..... 190
Bids for Contract No. 89..... 191

Progress of Contract Work.

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to June 1, 1912.
		Put under contract.*	Done to June 1, 1912.	Done during May, 1912.	
1	Empire Engineering Corporation	$580,424	$447,400	0	81.8
2	Ferguson Contracting Company *a*	968,512	694,390	0	73.0
2E	Holler & Shepard *b*	(283,890)	251,130	0	88.6
3	Sundstrom & Stratton	657,273	633,290	0	Finished.
4	Empire Engineering Corporation	726,780	720,073	0	Finished.
4B	E. J. Doyle & Company	1,351	1,332	0	Finished.
5	Empire Engineering Corporation *a*	156,941	125,820	0	80.2
5A	James Stewart & Company *b*	(317,597)	0	0	0.0
6	F. A. Maselli	1,026,550	1,033,864	0	Finished.
7	Groton Bridge Company	101,930	98,929	0	Finished.
8	Pittsburg-Eastern Company *a*	1,516,789	920,420	0	60.7
9	Thomas Crimmins Contracting Co	803,297	655,461	0	Finished.
10	McDermott Contracting Company *a*	1,111,965	668,360	0	60.1
10A	The T. A. Gillespie Company *b*	(101,144)	24,010	$14,760	23.8
10B	Oswego Construction Company, Inc. *b*	(491,295)	3,170	3,170	0.6
11	Fort Orange Construction Company	1,352,999	1,162,210	5,670	86.0
12	James Stewart & Company	3,555,467	2,411,900	40,780	67.9
13	Penn Bridge Company	28,126	20,180	0	71.7
14	Acme Engr'g & Contracting Company	2,985,225	2,485,920	8,380	83.3
14R	Thomas F. Riley	724	470	0	65.0
15	Atlantic, Gulf & Pacific Company	1,481,692	1,378,956	0	Finished.
16	United Construction Company	78,715	51,030	11,100	64.8
17	The Scofield Company *a*	842,418	57,560	0	6.9
17	Alexander Murdoch *b*	(812,286)	743,610	0	Finished.
18	Kelley Bros. Contracting Company	611,382	476,979	0	Finished.
19	Great Lakes Construction Company	891,401	731,640	13,670	82.0
20A	Houston Barnard	490,592	226,690	24,820	46.2
20B	S. Pearson & Son, Inc	1,032,210	322,190	50,890	31.2
20C	American Pipe & Construction Co	585,720	429,290	29,200	73.2
20D	American Pipe & Construction Co	2,685,477	90,980	1,860	3.4
21	Lane Brothers Company	1,323,150	595,660	19,540	45.0
22	M. Fitzgerald	127,521	25,770	1,110	20.2
23	Millard & Lupton Company	1,808,797	885,660	30,670	48.9
24	James D. Sherrill	44,368	5,840	0	13.2
25	Atlantic, Gulf & Pacific Company	1,694,037	1,464,680	13,970	86.4
26	Lake Erie Dredging Company	40,057	35,443	0	Finished.
27	Kinser Construction Company *a*	723,269	378,650	0	Finished.
27A	Holler & Shepard *b*	(449,192)	140,280	12,190	31.2
29	Maryland Dredging & Contr'g Co	690,321	407,320	720	59.0
30	Acme Engr'g & Contracting Co	2,558,955	1,177,000	115,310	46.0
31	Casey & Murray	831,302	717,460	10,420	86.4
32	Penn Bridge Company	46,797	44,375	0	Finished.
33	Penn Bridge Company	199,640	164,550	0	82.5
34	M. Fitzgerald	22,449	22,258	0	Finished.
35	Gilmour-Horton-Allen Company	748,045	547,680	26,750	73.2
36	J. D. Miller	46,800	46,800	0	Finished.
37	Henry P. Burgard	2,366,677	970,450	7,620	41.0
38	Henry Tosh & Son	16,870	16,287	0	Finished.
39	James Stewart & Company	1,048,674	184,040	26,450	17.6
40	United Engr'g & Contracting Co	2,252,144	1,721,680	22,020	76.5
41	Butler Bros. Construction Co	273,238	241,644	0	Finished.
42	Shanley-Morrissey, Inc	1,047,366	478,670	0	45.7
43	M. A. Talbot Company	1,365,876	191,140	19,300	14.0
44	Scott Brothers	1,751,479	752,330	26,590	42.9
45	Scott Brothers	472,802	418,652	0	Finished.
46	Kinser Construction Company	1,291,805	693,330	60	53.7
47	Crowell-Sherman-Stalter Company	1,279,328	798,110	5,000	62.4
48	Crowell-Sherman-Stalter Company	1,670,695	573,820	97,770	34.3
49	American Pipe & Construction Co	729,000	463,390	34,550	63.5
50	Buffalo Dredging Company	974,529	156,560	30,780	16.0
51	Alto Construction Company	392,397	102,310	8,600	26.0
53	Scott Brothers	167,585	164,576	0	Finished.
54	Hunkin-Conkey Construction Co	250,590	95,460	1,180	38.2
55	Arthur McMullen	945,840	873,020	1,930	92.4
55R	Joseph Kalk & Alfred S. Brown	7,561	6,100	470	80.7
60	Empire Engineering Corporation	1,491,317	1,263,370	15,400	84.7
61	Cleveland & Sons Company	1,088,890	774,980	44,340	71.2
62	I. M. Ludington's Sons, Inc	2,515,043	1,400,370	89,330	55.6
63	H. S. Kerbaugh, Inc	2,341,198	1,316,430	73,230	56.2

Progress of Contract Work—(*Continued.*)

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to June 1, 1912.
		Put under contract.*	Done to June 1, 1912.	Done during May, 1912.	
64	Empire Engineering Corporation	$1,335,434	$759,260	$10,370	56.8
66	Empire Engineering Corporation	854,394	736,860	33,320	86.3
67	Larkin & Sangster	1,149,401	576,260	30,290	50.2
68	Shanley-Morrissey, Inc	1,024,282	946,168	0	Finished.
69	I. A. Hodge & Company	240,061	198,670	7,740	82.8
70	Shanley-Morrissey, Inc	779,636	236,240	0	30.3
71	Shanley-Morrissey, Inc	1,561,119	821,960	0	52.7
72	Shanley-Morrissey, Inc	1,221,112	618,900	0	52.3
73	E. M. Graves	518,829	517,223	0	Finished.
75	United Construction Company	42,917	36,780	5,240	85.6
76	The T. A. Gillespie Company	1,512,011	723,460	12,680	47.8
77	The T. A. Gillespie Company	1,677,482	888,580	41,660	53.0
78	Cunningham-Woodard Company	49,026	47,723	0	Finished.
79	Lupfer & Remick	37,480	33,980	250	Finished.
80	Walter Bradley	117,391	109,140	1,010	93.0
82	Groton Bridge Company	28,841	21,320	0	73.9
85	Lupfer & Remick	13,151	12,000	2,450	91.3
86	Lathrop, Shea & Henwood Company	43,440	4,940	0	11.3
88	Lathrop, Shea & Henwood Company	25,658	0	0	0.0
89	Owego Bridge Company	59,616	0	0	0.0
90	D'Olier Engineering Company	180,318	164,240	1,540	91.2
91	The Hollington Company	44,985	13,660	3,230	30.4
104	R. B. Murdock	39,370	200	200	0.5
105	Skene & Richmond	258,710	0	0	0.0
	Totals	$73,735,036	$44,650,963	$1,089,580	.....
	Cayuga and Seneca Canal.†				
A	Scott Brothers	$357,627	$136,940	$6,610	38.4
B	Crowell-Sherman-Stalter Company	1,436,597	560,520	45,890	39.0
H	James H. Dawes	205,649	0	0	0.0
	Totals	$1,999,873	$697,460	$52,500	.....

* Includes all alterations in force to date. *a* Suspended by order of the Canal Board. *b* Relet to complete former contracts, contract price not included in total. † Authorized by separate appropriation.

Brief Account of Contract Work for May.

The following pages show what has been done during the month on the several contracts now in force on the Barge canal. The Erie canal contracts are described in order from Waterford west to Buffalo, and the Champlain and Oswego canal contracts follow, in order from south to north, while the Cayuga and Seneca canal contracts are given from east to west.

Erie Canal.

Contract No. 33.— Lock-gates and valves, guard-gates, etc., on Contracts Nos. 2, 10, 11 and 15.

The installation of sluice-gates at Locks Nos. 3, 4, 5 and 6, on Contracts Nos. 2-E and 11, has been completed.

Contract No. 16.— For eleven steel highway bridges, ten of which are at various points on Contracts Nos. 25 and 27, Champlain canal, and the remaining one on Contract No. 11, Erie canal.

On Contract No. 27-A, the bridge at East street was assembled and riveted; delivery of steel began for Argyle street bridge.

On Contract No. 25, painting was done at Comstock, Fort Ann, Smiths Basin, Brayton's and Dewey's bridges. At George Henry's bridge, falsework and about 100,000 lbs. of steel were erected.

Contract No. 13.— For three bridge superstructures on Contract No. 12 and two on Contract No. 18.

No contract work was done.

Contract No. 2-E.— For completing the construction of the canal from the Mohawk river at Waterford to a point about one-fourth mile above the head of Lock No. 3.

Forms were stripped from concrete walls at lower approach to Lock No. 2 and at site of old coffer-dam in Champlain canal. Above the lock the old coffer-dam was removed and the prism cleaned up.

Contract No. 11.— For prism excavation and construction from Contract No. 2 to Mohawk river below Crescent, including Locks Nos. 4, 5 and 6, highway, bridge abutments, guard-gate, masonry, etc.

About 878 cu. yds. of second-class concrete were placed as follows: In the north wall at Mohawk river, completing it, 57 cu. yds.; south wall at river, 490 cu. yds.; north approach below Lock No. 6, 211 cu. yds.; docking walls between Locks Nos. 5 and 6, 120 cu. yds. Cleaning up prism below Lock No. 4 was continued, material being used as embankment at north retaining wall. The Bucyrus shovel removed 1,000 cu. yds. from the by-pass of Lock No. 4. The Vulcan shovel removed about 1,300 cu. yds. from the south side of the rock cut, also placing material at Lock No. 4.

The notch for wash wall was cut on west side of north core wall at Lock No. 6, using material as embankment around spillway of the lock. About 7,000 lin. ft. of rock were drilled and 720 sq. ft. of surface channeled.

Contract No. 14.— For work from Contract No. 11 to a point near Rexford Flats aqueduct, including Lock No. 7 and Dams Nos. 2 and 3; also for constructing Locks Nos. 13, 14 and 15, Dams Nos. 9, 10 and 11, Mindenville retaining dam, etc.

At Dam No. 3, Lock No. 7, Vischer's Ferry, a traveler in the prism at the west end of Lock No. 7 excavated about 1,330 cu. yds. of material, together with quite an amount below grade. At Dam "E," Vischer's Ferry, about 550 cu. yds. were removed by picks and shovels, after blasting. Some 4,350 cu. yds. of first and second-class embankment were placed at the upper approach and wing walls of Lock No. 7. Additional fenders were placed at the lower ends of the upper approach walls. About 507 cu. yds. of second-class concrete were placed in the apron of Dam "E." At the wing wall of the lock about 294 cu. yds. of wash wall were placed under contract and also 80 cu. yds. on the upstream face under an extra work order. The second field coat of paint was placed on the head-gates and at the Stoney gate. A crib, replacing the one destroyed, was completed in the old canal near the latter gate. Other work was in changing track, rigging derrick-boat, scraper-tower, etc.

At Dam No. 9, Lock No. 13, Yosts, painting the bridge was completed, buildings and plant removed and the dam tested by lowering into place. Quantities: Structural steel, 19,637 lbs.

At Dam No. 10, Lock No. 14, Canajoharie, painting the bridge and gates of the dam was completed. Quantities: Structural steel, 24,119 lbs.

Contract No. 14-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 14 to new burial plots outside the flow lines.

No work was done.

Contract No. 20-D.—For dredging Mohawk river channel, constructing stream entrances, etc., between deep water below Rexford Flats aqueduct and center of bridge at Dam No. 9, at Yosts.

The dipper-dredge excavated channels through the rift and under the highway bridge, in the latter case casting the material over to side. Other prism excavation continued, material being placed in scows and dumped in the back channel opposite the Shuttleworth mills. Installation of machinery on the new hydraulic dredge continued. The hull for another large dump-scow is nearly ready to launch. The new tug began work. Stone was

hauled to Danoscara creek entrance. A traveling derrick was completed at Tribes Hill, for rock excavation above Lock No. 12.

Quantities: Excavation, 3,648 cu. yds.

Contract No. 8.— For constructing Dam No. 4 and Lock No. 8, at Scotia; Dam No. 5 and Lock No. 9, at Rotterdam; Dam No. 6 and Lock No. 10, at Cranesville, all on the Mohawk river.

Contract canceled. Final estimates being prepared.

Contract No. 17.— For constructing Dam No. 7 and Lock No. 11, at Amsterdam, and Dam No. 8 and Lock No. 12, at Tribes Hill.

Contract finished. Final estimates being prepared.

Contract No. 20-C.— For dredging Mohawk river channel, constructing stream entrances, etc., between center of bridge at Dam No. 9, at Yosts, and center of bridge at Dam No. 10, at Canajoharie.

The hydraulic dredge continued excavating in river, spoiling about 19,647 cu. yds. on the Keck area, upon which were also placed about 19,467 cu yds. excavated at the outlet of Flat creek. The dipper-dredge also excavated about 18,056 cu. yds., which material was towed down the river and dumped along the banks or in deep water. Quarrying, hauling and dressing stone for Lasher's and Yatesville creek entrances was continued. About the middle of the month a coffer-dam was begun for Canajoharie creek stream entrance work.

Contract No. 86.— For the construction of one span of a highway bridge over the Mohawk river at Canajoharie, to replace two existing spans, which will be removed.

No construction work was done.

Contract No. 20-B.— For dredging Mohawk river channel, constructing stream entrances, etc., between the center of bridge at Dam No. 10, at Canajoharie, and the upper miter wall of the new lock at Mindenville.

One of the dipper-dredges excavated shale rock at the entrance of Lock No. 16 and cleaned up the prism below. Material was spoiled on north bank above Hough creek.

The other dipper-dredge and hydraulic disposal-boat continued prism excavation, spoiling fine material on north side and on

Place spoil area. Coarse material was placed along the north bank. About 21,800 cu. yds. were spoiled.

At Otsquaga creek stream entrance, plant is being installed and coffer-dam built.

Quantities: Excavation, 42,886 cu. yds.; wash wall, 304 cu. yds.; cobblestone protection, 11,430 cu. yds.

Contract No. 20-A.—For dredging Mohawk river channel, etc., between Castle creek and upper miter wall of lock at Little Falls.

Prism excavation with steam shovel progressed between Castle creek and bridge No. 131, depositing material in spoil on south side. Pumping to drain prism and wash wall excavation on south side continued. The orange-peel bucket machine excavated in prism, depositing material in wagons for embankment on south side of Castle creek between the Erie canal and West Shore railroad.

In the river line, the 12-in. hydraulic dredge began on north side east of suspension bridge on May 11, spoiling material on south side in river.

Wash wall was laid on south side, using cobblestones from the excavation and stone from wall along the creek near feeder. The Rocky Rift feeder was closed during the last half of the month to allow the steam shovel to continue work. On May 29 the plant was removed and water admitted because of difficulty in maintaining the required level for navigation through the Little Falls feeder.

Quantities: Excavation, 29,544 cu. yds.; embankment, 448 cu. yds.; wash wall, 459 cu. yds.

Contract No. 31.—For improving the Erie canal at Little Falls, constructing Lock No. 17, and modifying the dam and constructing guard-gates at Rocky Rift.

Excavating between the locks continued. Excess material was spoiled in river east of Adirondack mill. From lock No. 38 to west end of contract, the prism excavation is approaching completion. On south side west of German street, excavation for retaining wall on top of the rock progressed, material being used for embankment behind wall and to grade tow-path under bridge, between the guard-gates and Hansen avenue. Excavation for dry wall on south side of canal was completed, the earth being used for embankment behind retaining wall No. 4, on north side and the stone hauled to the crusher. Excavation for rock pile on

south side near grain elevator began May 20. Some stone were spoiled in old quarry to the west and some were selected and cut for the dry wall. Excavation at rear of tow-path for dry wall in front of Adirondack mill was completed. Excavation on north side of Erie canal opposite the Adirondack mill began May 24. Skips were loaded with riprap stone and shipped from the contract by boat.

About 38 cu. yds. of crushed stone from prism near crusher were placed on tow-path in rear of retaining wall west of German street. Some 6,500 ft. B. M. of sawed lumber were used in building tow-path trestle east of lock No. 39. Nine round piles, aggregating 155 lin. ft., were also used in the trestle.

About 442 cu. yds. of second-class concrete were laid in retaining wall on north side, in retaining wall on south side west of German street and in completing stairway at east end of south lock wall. Steel ladders were placed in lock and retaining walls and reinforcement in the stairway.

At the Indian Castle guard-gates the lower section of the tracks were placed, gates fitted to concrete sills, brakes adjusted, etc.

The grain elevator was removed nearly to the top of the stone foundation. Repairs to concrete of lock and retaining walls were made. Water was admitted to the old canal for navigation purposes on May 13.

Quantities: Excavation, 4,410 cu. yds.; metal in guard-gates, 11,612 lbs.

Contract No. 30.— For dredging channel in Mohawk river and land line from Little Falls to Sterling creek, constructing Lock No. 18 at Jacksonburg, Dam No. 14 and guard-gates at Herkimer, retaining dam at Frankfort, bridges, etc.

At Little Falls rock cutting the prism is practically completed, except work within the coffer-dam and trimming a short length of slope. The coffer-dam has been left in place for future use. Plant is being removed to the south bank of the river where cribs are being built and placed for another coffer-dam.

At Jacksonburg the Thew shovel constructed dikes on the south bank, on the Casler and Carver properties. The shovel is now working on Eysaman island. The dredge *Herkimer,* on triple shifts daily, excavated 61,900 cu. yds. of soft material from canal prism.

At Lock No. 18 the pit was unwatered and work resumed on excavation for concrete toe wall riprap protection at each end of

lock wall. The toe wall has been placed and riprap begun. The lower gates have been erected and 50 per cent riveted. The upper gates are completed, except for final coat of paint. The upper buffer-beam is in place and partly painted. The miter-sills for upper gates are placed. Between Lock No. 18 and Fort Herkimer a traveling derrick and tower scraper have been building embankment. At Fort Herkimer wash wall was built. At Washington street, Herkimer, excavation for concrete wall continued. Tower No. 5 excavated from prism, placing material in north embankment and spoil and has also built dikes. The old tow-path is being used for navigation purposes. At Mohawk street, Herkimer, the temporary road around highway improvement was completed and opened for traffic. About 1,636 cu. yds. were excavated at the north abutment of the bridge. Plant for the guard-gate and Dam No. 14 is being erected. The coffer-dam for this work is about 75 per cent in place.

At Ilion machinery was delivered for building new river crossing and stumps, etc., were blasted from the river bank. The hydraulic dredge *Clinton,* working on triple shifts, removed 233,159 cu. yds. of material from prism to spoil.

At East Schuyler road sand was delivered and plant is being erected to build south abutment. The derrick sloper continued trimming the north slope, material being placed in canal prism.

About 2 miles west of Frankfort tower scraper No. 2, operating on the south side, is filling in the easterly branch of the old river channel, using material from spoil bank. Dikes are being raised at various places west of Frankfort.

Quantities: Excavation, 305,834 cu. yds.; sheeting and bracing, 4,835 ft. B. M.; embankment, 6,760 cu. yds.; concrete, 30 cu. yds.; dry stone work, 353 cu. yds.; riprap, 75 cu. yds.; metal in lock-gates, 114,944 lbs.; metal in buffer-beams, 29,514 lbs.

Cantract No. 29.— For excavating prism from Sterling creek to Oneida-Herkimer county line, constructing lock at Sterling creek, bridges, etc.

The excavation during the month consisted largely of material washed into the prism by various creeks, the amount allowed being 1,626 cu. yds. The amount of embankment allowed was 1,681 cu. yds. About 54 cu. yds. of lining and 75 cu. yds. of riprap were placed behind the south wall of Lock No. 19. The trimming of banks progressed and Burch culvert was unwatered.

Contract No. 42.— For prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillway, stream entrances, culverts, etc.

At Park avenue bridge, about 52,200 lbs. of steel were placed. Riveting was completed and about three-quarters of the first field coat of paint was applied.

Work on this contract is suspended, pending further action by the Canal Board.

Contract No. 43.— For constructing the canal from a point just south of Oriskany road to about 1,500 feet west of Mud creek.

The dredge *Stanwix* removed 86,675 cu. yds. of material from the prism. Teams and wheelbarrows at the west guard-gate excavated about 8,100 cu. yds. About 1,494 lbs. of structural steel were placed at the Oriskany bridge over the river channel. About 187 lin. ft. of latticed railing were set at the Mill street bridge.

Contract No. 44.— For constructing the canal from about 1,500 feet west of Mud creek, west of Rome, to about three miles west of New London, including junction lock, Locks Nos. 21 and 22, bridges, culverts, spillways, stream entrances, etc.

About 48,331 cu. yds. were excavated, of which shovel 1347 removed 4,852 cu. yds., shovel 883 removed 6,904 cu. yds. and shovel 481 removed 19,931 cu. yds. Tower scraper No. 2 took out 3,484 cu. yds. At the dive-culvert, 478 cu. yds. were excavated. A traveling derrick and bucket at Lock No. 21 and approach walls removed 5,228 cu. yds. Tower scraper No. 1 and derrick at Lock No. 22 and approach walls excavated 7,454 cu. yds.

At junction lock, 1, 347 cu. yds. of second-class concrete were laid and 64 lbs. of reinforcing metal and 1,743 lbs. of castings were used.

At south ditch, 12 cu. yds. of lining and 45 sq. yds. of second-class stone paving were laid.

At Lock No. 21, 3,623 sq. ft. of second-quality steel piling were used. About 1,024 ft. B. M. of sheeting and bracing and 26 lin. ft. of round timber were also used. Some 19 cu. yds. of lining were placed at the bridge and 3,952 lbs. of structural steel used in lock and bridge. About 1,329 lin. ft. of foundation piles were driven. Some 465 cu. yds. of second-class concrete were laid in the lock floor. In the bridge, 6 cu. yds. of concrete and 2,625 lbs. of reinforcement were used. About 73 sq. yds. of wooden pavement were laid. In the lock gates 4,437 lbs. of metal were placed.

Contract No. 12.— For excavating prism between Oneida lake and Mosquito Point bridge on Seneca river; constructing Lock No. 23 and other structures.

At Oak Orchard, hydraulic dredge No. 1 excavated about 65,000 cu. yds. of material from the prism. Dipper-dredge No. 4 began work May 9, working in hard material, part of which was cast over to be rehandled by dredge No. 7, which began work on May 12.

At Lock No. 23 concreting in both lock walls was advanced, about 2,188 cu. yds. being laid.

At the western end of the contract dredge No. 5 completed repairs and began prism excavation May 17, removing 25,133 cu. yds. of material.

Quantities: Excavation, 130,325 cu. yds.; structural steel, 669 lbs.; metal reinforcement, 1,097 lbs.; castings, 10,318 lbs.

Contract No. 22.— Bridges on Contract No. 12.

At Jordan bridge the south abutment is practically finished.

At State Ditch bridge excavation for both abutments was made and a temporary bridge for traffic is being constructed.

At Weedsport bridge cribs have been partly built under the south two panel points.

Quantities: Excavation, 74 cu. yds.; concrete, 84 cu. yds.; structural steel, 1,737 lbs.; reinforcement, 2,560 lbs.

Contract No. 46.— For the construction of the canal from Fox Ridge to the southeast corner of the town of Galen, including Lock No. 25, a movable dam at May's Point, bridges, etc.

Repairs to plant at May's Point continued. No construction work done.

Contract No. 47.— For the construction of the canal from the southeast corner of the town of Galen to a point near the N. Y. C. & H. R. railway crossing at Lyons, including Lock No. 26, a dam across the Clyde river, highway bridge, stream entrance, etc.

Work on this contract is confined to Lock No. 26 and dam. The coffer was repaired, lock pumped out and cleaned of mud, gates finished and painted and miter-posts fitted. About 1,400 cu. yds. of material were excavated at the dam and placed in spoil.

Contract No. 5-A.—For the completion of Contract No. 5, from Mosquito Point to Campbell's bridge, including construction of

Owasco creek entrance, reconstruction of bridge at Mosquito Point and new pier and approaches at Howland island bridge, etc.

Plant has been assembled, housing for employees built, material hauled and cribs built under Mosquito Point bridge for removal in order to operate dredges.

Contract No. 48.— For the construction of the canal from a point near the N. Y. C. & H. R. railway crossing at Lyons to a point near the West Shore railway crossing at East Newark, including Locks Nos. 27 and 28-A, dam and power-house, retention dam across Canandaigua outlet, spillway, culverts, highway, bridge, approaches, etc.

The dipper-dredge continued its work at the eastern end of the contract, loosening material to be rehandled by the suction dredge. The latter has removed 140,200 cu. yds. of material from between the locks. About 398 cu. yds. of concrete were placed at the abutments of the Geneva street bridge. In the lower approach of Lock No. 27, driving piles continued and 495 cu. yds. of concrete were placed.

At Lock No. 28-A, 2,010 cu. yds. were excavated and 754 cu. yds. of concrete placed in the lower approach. About 276 cu. yds. of concrete were also placed in the lock proper. The erection of the Poorhouse bridge was started. Some work was done at the spillway beyond and puddling was begun at the dive-culvert. The Marion shovel, working in prism between the spillway and Fink's highway, removed 10,542 cu. yds. of material. The Browning excavator with drag-line, took out 12,112 cu. yds. at the west end of the contract.

Contract No. 76.— For the construction of the canal from a point near the West Shore railway crossing at East Newark to a point about one-half mile east of Port Gibson.

Steam shovels Nos. 20 and 21 operated in prism until the middle of the month, removing 17,769 cu. yds. of material, which was placed in embankment. About 231 cu. yds. of concrete were placed in the lower approach walls of Lock No. 28-B and the abutments of the bridge at that point.

Contract No. 77.— For constructing the canal from one-half mile east of Port Gibson to one-half mile west of Palmyra, including Lock No. 29, power-plant, bridges, culverts, etc.

The suction dredge *Palmyra,* working east, removed 58,467 cu. yds. of material. At Galloway's bridge the south abutment was

completed and work on the north side started. About 758 lin. ft. of foundation piles were driven and 219 cu. yds. of concrete placed. A ditch was excavated in rear of the spoil bank at Palmyra dock. The construction of approaches at Maple avenue and Limerick street bridges has progressed.

At Lock No. 29 plant was erected and steam-shovel No. 20 installed. At Port Gibson bridge preparatory work also began.

Contract No. 49.— For prism construction from a point about 500 ft. east of Yellow Mills bridge, about one mile west of Palmyra, to the Monroe county line, including Lock No. 30, sluicegates, highway bridges, culverts, etc.

The suction dredge *Fairport* removed 31,414 cu. yds. of material at the west end by the middle of the month, after which it ceased operations for the season. At Wayneport the bridge was erected and riveting commenced. At Frear's bridge, 144 cu. yds. of second-class concrete were placed.

At Lock No. 30, 4,983 cu. yds. were excavated and 1,318 cu. yds. of concrete placed. At the bridge below, about 238 lin. ft. of foundation piles were driven and 84 cu. yds. of concrete placed.

Repairs to the leak have progressed and will soon be completed.

Contract No. 63.— For enlarging present canal and constructing culverts, sluiceways, waste-weir, guard-gates, dock walls, bridges, highway changes, etc., between Wayne-Monroe county line and Kings Bend.

The hydraulic dredge *Fairport* began cleaning bottom of prism on May 20, pumping material to adjacent spoil banks. The Lidgerwood excavator worked about three-quarters of the month excavating from north side of prism near the trolley bridge, casting material into adjacent embankment or spoil. The Fogarty excavator worked about half the month in prism west of Wiltsie's bridge, placing its output on the north approach of the bridge. Three steam-shovels worked up to the middle of the month, two in prism and the third in borrow-pit. Material was placed in embankment, bridge approaches and as backing for concrete trough walls.

Concrete was placed in culverts Nos. 28, 30 and 33, Bushnell's Basin and Cartersville guard-gates, Fairport dock wall, Parker street, Cartersville and Main street, Pittsford, bridges, prism lining and Irondequoit trough.

At Cartersville guard-gate operating machinery was installed. Knapp's bridge was erected and riveted. Parker street bridge

was erected and riveting partly done. Fullam's Basin bridge was riveted. At State street bridge concrete sidewalks are being laid.

Riprap was placed at south abutment of Cartersville bridge and on top of the puddle fill on the Irondequoit bank. Wash wall was built and coping-stone laid at several places and lining was placed on the tow-path in several localities. Two temporary stop-gates near Irondequoit fill and a temporary spillway at Cartersville were completed. Dikes for spoil are being repaired for dredging operations.

Quantities: Excavation, 27,385 cu. yds.; embankment, 9,859 cu. yds.; concrete, 4,616 cu. yds.; wash wall and riprap, 1,037 cu. yds.; structural steel, 278,173 lbs.

Contract No. 23.— For prism excavation between Kings Bend and Genesee river, and construction of Locks Nos. 32 and 33, guard-lock, bridges, culverts, etc.

Pumping was maintained at Lock No. 33, in prism west of Lock No. 32 and near East Henrietta road. Shovel 2449 continued excavation of prism at the deep cut in vicinity of East Henrietta road, spoiling material on north bank near Clinton avenue. Shovel 1178 began May 30, in same locality. Shovel 667 began May 7, excavating prism east of Lock No. 33, disposing of material behind walls of the lock and in approaches to Edgewood avenue bridge. Excavating by scrapers and teams or by hand and derrick-skips was also done at Edgewood avenue culvert and spillway, at forebay of Lock No. 33, in drainage ditch and at Westfall road.

A small amount of embankment was built under the apron of the spillway at Lock No. 33. Lining was placed on approaches to East Henrietta and Kingsley's road bridges, Edgewood avenue bridge and resurfacing part of Westfall road. Concrete was placed in Lock No. 33 and its upper guide wall and also in Edgewood avenue culvert and spillway. East Henrietta road bridge was opened to traffic on May 22. South avenue and Clinton avenue bridges have been painted. Wooden fencing on bridge approaches was built.

The city of Rochester has carried its new pipe line under East Henrietta road bridge and the temporary line built in 1910 across the prism has been removed, giving the contractor freedom from obstruction at that point.

Quantities: Excavation, 22,779 cu. yds.; lining, 629 cu. yds.; second-class concrete, 3,096 cu. yds.; wooden sheet-piling, 14,520 ft. B. M.

Contract No. 21.— For prism excavation and construction of bridge abutments, guard-lock, etc., from the Genesee river west 2.56 miles to a point just west of the N. Y. C. & H. R railway crossing.

Electric drainage pumps continued operating at Scottsville road and Brooks avenue crossings. Shovels Nos. 3 and 4 operated in prism, removing 37,797 cu. yds. of earth and rock to spoil. The locomotive crane cleared out loose rock on channel bench and in guard-lock site. From 14 to 15 drills operated ahead of the shovels. Five channelers were employed in surfacing prism lines. At the guard-lock a concrete plant was erected.

Contract No. 82.— For furnishing and erecting three steel highway bridge superstructures on Contract No. 21, near Rochester.

No work was done on this contract, because the abutments on Contract No. 21 are not yet ready.

Contract No. 75.— For construction of three guard-gate superstructures on Contracts Nos. 60, 61 and 64.

At the Spencerport and Brockport guard-gates, the placing of operating machinery was completed, concrete placed for counterweights and entire steelwork painted. A small amount of adjusting and strengthening of guides remains to be done.

Contract No. 105.— For the construction of five lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Union street, Spencerport; Washington street, Adams Basin; Park avenue, Brockport; Hulberton; Gasport.

At Adams Basin work began on May 8. Plant was delivered and erected, including a floating pile driver, steel sheet-piling and round timber piles were driven for coffer-dam and temporary towpath at north abutment.

Contract No. 60.— For prism excavation and construction of culverts, bridge structures, etc., between a point 1.75 miles east of South Greece and a point 0.5 mile west of Adams Basin.

Excavation in prism, for puddle lining and trimming slopes was continued with teams and also by hand and Koppel cars until water was admitted to the prism. Banks were leveled and towpath graded. The ladder-dredge began work in the prism on May 27. Puddle lining in considerable quantities was placed on the slopes. New wash wall was built and old wash wall repaired in

several places. Some puddle for lining the bottom was deposited by shoveling overboard from a scow.

At culvert No. 45 the uncovered part of the south extension was backfilled and placed in good condition before water was admitted.

At culverts Nos. 49, 50 and 51, paving around the drains was done as well as concreting around the drain at culvert No. 50. Temporary timber tow-paths were built at the north abutments of the guard-gate and at bridges Nos. 95 and 99. At the guard-gate a portion of the paving was placed before navigation began. Considerable lining has been placed on the tow-path. Quantities: Excavation, 3,740 cu. yds.; embankment, 4,885 cu. yds.; puddle, 3,071 cu. yds.; wash wall, 2,201 cu. yds.; paving, 309 sq. yds.

Contract No. 61.— For prism excavation and construction of culverts, bridges, waste-weir, etc., between a point 0.5 mile west of Adams Basin and Monroe-Orleans county line.

The three Lidgerwood excavators were in operation portions of the time, clearing up the prism in various places and disposing of the material in adjacent embankment or spoil bank. Excavator No. 2 loaded its material into scows which were towed to the south side and unloaded by clam-shell derrick, material being placed in embankment. Rock excavation in various places was continued up to the time of filling the canal. Some material from excavation was also placed in north approaches of bridges Nos. 104 and 106, completing these approaches.

Backfilling was done at culverts Nos. 58 and 59 and at north abutment of bridge No. 110. A temporary timber tow-path was built at the north abutment of the guard-gate. Paving was placed around the north opening.

At bridge No. 110, riveting was completed.

Excavation for wash wall progressed at several places and the bottom course of stone was laid, to bring it above the water line.

Quantities: Excavation, 16,857 cu. yds.; embankment, 10,448 cu. yds.; wash wall, 11,884 cu. yds.; paving, 68 sq. yds.

Contract No. 62.— For prism excavation and construction of culverts, bridge substructures, etc., between Orleans-Monroe county line and a point near Eagle Harbor bridge.

Albion section:

About 36,600 cu. yds. were excavated, by an orange-peel bucket in the vicinity of culvert No. 71, by a McMyler with dragline on the berme east of culvert No. 73, by an orange-peel bucket

west of culvert No. 73, by a Bucyrus with drag-line near culvert No. 75, by a clam-shell bucket near culvert No. 78 and by a Lidgerwood excavator near culvert No. 73.

About 2,700 cu. yds. of embankment were formed, at culverts Nos. 71, 73, 75, 77, 82 and 83, in backfill at Eagle Harbor trough and waste-weir and by the McMyler excavator working east of Transit bridge.

About 1,150 cu. yds. of concrete were placed, covering work at Albion vertical wall, Eagle Harbor trough, Lattin's guard-gate, culverts Nos. 71 and 75, and Brockville, Brailey's, Transit, Bidwell's and Gaines bridges.

About 480 sq. yds. of stone paving were laid at culverts.

Some 20,000 lbs. of structural steel were used at Transit and Bidwell's bridges. About 11,900 lbs. of reinforcement were used at Eagle Harbor trough and in various bridge slabs. About 265 sq. yds. of wooden pavement were laid at Transit bridge. Some 3,200 cu. yds. of wash wall were built on tow-path east of Brockville and west of Hindsburg bridges.

Holley section:

About 24,000 cu. yds. were excavated, by shovels Nos. 3 and 4 in prism, by shovel No. 3 leveling spoil on berme bank west of McGuire's bridge, by Koppel car outfit from borrow-pit at County Line bridge, from wash wall notch west of McCarthy's and east of Orr's bridges.

About 6,700 cu. yds. of embankment were formed on tow-path east of McCarthy's bridge. About 340 cu. yds. of concrete were laid at Holley trough and waste-weir. In Hulberton retaining wall 818 cu. yds. of rubble masonry were laid. Some 450 cu. yds. of wash wall were laid on the berme, west of McCarthy's and east of Orr's bridges. At McCarthy's bridge 175 sq. yds. of third-class and 531 sq. yds. of second-class paving were laid. About 18,000 lbs. of metal reinforcement were used at Holley trough and waste-weir and 254 sq. yds. of wood block pavement were laid at Holley lift-bridge.

Contract No. 64.— For improvement from 600 ft. west of Prospect street, Medina, to 100 ft. east of Gasport bridge.

About 6,300 cu. yds. were excavated, by teams in prism and by dipper-dredge and scows. About 2,000 cu. yds. of prism embankment were formed. Some 399 cu. yds. of puddle were placed and 1,800 cu. yds. of wash wall built at various points. About 500 sq. yds. of stone paving were laid at Maybee's waste-weir and at northeast wing wall at Middleport. Some 8,800 lbs. of cast-

iron pipe, etc., were used at small culvert under approach of Hurd's bridge.

Construction of dredge and repairs progressed.

Contract No. 66.— For prism excavation and constructing bridges and approaches, culverts, etc., from 100 ft. east of Gasport bridge to 600 ft. east of Lockport locks.

The total amount excavated was 10,499 cu. yds. The total embankment formed was 3,071 cu. yds.

At Gasport a Browning crane with scale buckets and hand labor, on triple shifts, took out 1,967 cu. yds. and placed 28 cu. yds. in embankment. Near Millard's bridge two Koppel car outfits and a Browning crane with orange-peel bucket removed 1,456 cu. yds. from prism. At Young's bridge a Browning crane with scale buckets took out 495 cu. yds. and placed 788 cu. yds. of first-class embankment. At culvert No. 120, 634 cu. yds. were excavated from puddle notch on berme and 1,771 cu. yds. of embankment were placed on both sides of the canal. Between Young's bridge and Exchange street, Lockport, 5,947 cu. yds. were excavated from prism by steam-shovel outfit and hand labor, and 84 cu. yds. of embankment were placed on tow-path. The above work was done before navigation opened. About 400 cu. yds. of second-class embankment were placed on the berme, east of Angelus mills, Lockport.

At culvert No. 120, 1,006 cu. yds. of puddle were placed on the berme slope. Between Lake avenue and Exchange street, on tow-path side, 573 cu. yds. of puddle were placed. At Lockport waste-weir 7 cu. yds. of concrete and 58 yds. of second-class stone paving were placed. At Gasport, 37 sq. yds. of second-class paving were placed. At various places on the tow-path 769 cu. yds. of lining were placed, and 318 cu. yds. were placed on south approach to Millard's bridge.

About 2,205 cu. yds. of wash wall were built at various places, mostly on the berme side. At Lockport, 1,135 sq. ft. of steel sheet-piling were driven in tow-path.

Contract No. 67.— For construction of Locks Nos. 34 and 35 and approaches, etc., at Lockport.

The total excavation was 2,438 cu. yds. About 1,038 cu. yds. of earth and rock were removed from the lower end of Lock No. 34 by one derrick and hand labor during the last three weeks of May. This material was used to backfill behind the lock walls. The Thew shovel, working for two weeks, excavated

about 1,400 cu. yds. of earth from the site of the Main street bridge abutments, material being hauled by teams to adjacent dumping grounds.

Piers 2 to 16, inclusive, of the lower guide wall were completed by placing 184 cu. yds. of second-class concrete. About 1,531 cu. yds. were deposited in sections of the lower thrust wall of Lock No. 34. About 36,136 ft. B. M. of creosoted lumber and 1,116 sq. yds. of wood block pavement were placed on the east end of Main street bridge, completing and opening for traffic a roadway about 80 feet wide. Electric railway traffic was diverted to a temporary crossing of the new portion of the bridge and removal of the west section of the old structure completed. Erection of steelwork of Transit street bridge was completed with placing and riveting 189,465 lbs. of metal.

The needle-dam at the lower end of Lock No. 34 was erected in place and now serves to keep dry the site of the lock as concreting progresses. Work on the tow-path guard-rail was completed as far as excavation for Main street bridge abutments will allow.

Contract No. 40.— For constructing the canal, culvert entrances, guard-gates, stream entrances, bridges, etc., from the Lockport locks to Sulphur Springs guard-lock.

The total excavation for the month was 8,633 cu. yds., of which shovel No. 15, working with double-boom crane west of Summit street, removed 1,787 cu. yds. of rock; 760 cu. yds. of earth were excavated and 931 cu. yds. of embankment were placed at the retaining wall west of Hinman road; the cantilever, working about one-quarter mile west of Riley's bridge, removed 5,106 cu. yds. of earth; 980 cu. yds. of earth were excavated and 853 cu. yds. of embankment placed at the retaining wall near the guard-lock. All of the above work was completed before the opening of navigation.

About 208 cu. yds. of lining were placed on the tow-path east of the guard-lock. About 165 cu. yds. of concrete were placed, of which 7 cu. yds. were in the north abutment of the Summit street bridge, 82 cu. yds. in the vertical wall west of Hinman road, 27 cu. yds. in the vertical wall east of the guard-lock and 49 cu. yds. in the splay wall at the east end of the west rock cut. Some 221 cu. yds. of wash wall were laid on the tow-path side east of Hinman road. Riley's bridge was completed and Summit street bridge was painted one field coat. About 10,135 lbs. of structural

steel were used. About 198,704 lbs. of metal were placed in the new guard-gates.

Contract No. 19.— For prism excavation, rebuilding bridges, constructing masonry culvert, concrete-capped pile docking, etc., between Sulphur Springs guard-lock and mouth of Ellicott creek.

The total excavation for the month was 77,212 cu. yds., of which 364 cu. yds. were removed by the clam-shell dredge *Lawton* near the guard-lock and 297 cu. yds. by the same dredge elsewhere, the remainder being excavated by the hydraulic dredge *Niagara* west of Bush's bridge, working double shifts. Of this, 55,575 cu. yds. was material excavated by the dipper-dredge *Buffalo* at Tonawanda and rehandled. The embankment at Tonawanda stream entrance abutments was completed. The excavator *Lehigh* built dikes on the George Rossow property. Repairs to Martinsville dock began, the pile-driver and derrick-boat *Teddy* working here about two weeks. About 300 lin. ft. of old dock were removed. Some 54 35-ft. piles and 9 20-ft. anchor piles were driven.

The Tonawanda creek tow-path bridge was removed and about 1,200 cu. yds. of embankment were placed here in approaches. Part of this material was taken from spoil by teams and scrapers and the remainder from the prism by the clam-shell *Lawton.*

Champlain Canal.

Contract No. 70.— For dredging a channel in the Hudson river from outlet of Barge canal at Waterford to Lock No. 1.

Work on this contract is suspended, pending further action by the Canal Board.

Contract No. 71.— For constructing Lock No. 1 and Dam No. 1, above Waterford, and dredging Hudson river from Lock No. 1 to lower Mechanicville lock.

Work on this contract is suspended, pending further action by the Canal Board.

Contract No. 69.— For constructing Lock No. 2, at lower Mechanicville.

Work on the lock gates was continued. Practically all the rivets in the upper gates were driven and painting and fitting of gate timbers well advanced. At the lower gates the steel is being rapidly assembled, water in the lock being sufficiently lowered by the middle of the month to permit progress. Miscellaneous work included progress on the upper needle-dam, setting 10 snubbing-

posts, buffer-beam plates, laying conduits across the lock chamber and setting lower miter-sill. Quantities: Excavation, 294 cu. yds.; sawed lumber 2,603 ft. B. M.; iron and steel, 6,266 lbs.

Contract No. 72.— For dredging the Hudson river from lower Mechanicville to Stillwater.

Work on this contract is suspended, pending further action by the Canal Board.

Contract No. 88.— For the construction of a steel highway bridge at Schuylerville, within the limits of Contract No. 73.

No contract work done. Plant is being assembled and ferry to maintain traffic during construction is being built.

Contract No. 1.— For dredging Hudson river from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; constructing Crocker's Reef dam and approaches to "Land Line," etc.

Work closed down indefinitely.

Contract No. 24.— For constructing guard-gate at Crocker's Reef.

No work was done.

Contract No. 54.— For constructing Lock No. 7, at Fort Edward.

The concrete plant was completed. Riprap stone were placed on the embankment of the northwest approach wall. Continued high water prevented unwatering the coffer-dam. Timbers for lock-gates were framed. Quantities: Excavation, 460 cu. yds.; dry stone work, 406 cu. yds.

Contract No. 27-A.— For completing the construction of the canal between the Hudson river at Fort Edward and the south end of Contract No. 25, at Dunhams Basin road.

About 8,932 cu. yds. were excavated from spoil banks. Other excavations amounted to 4,327 cu. yds., about half of which was from the prism, the other half being from various structures. Some 1,211 cu. yds. of embankment were formed, of which 38 cu. yds. were at East street bridge approaches, 378 cu. yds. at southwest approach to Lock No. 8, and the remainder from east side of prism.

Some 7,820 ft. B. M. of flooring were placed on East street bridge, completing it. About 6,439 ft. B. M. of pine were used in

miter and tumble-gates and 176 ft. B. M. of white oak in valves at junction lock. One 20-ft. and 80 15-ft. foundation piles and 4,312 ft. B. M. of sheet-piling were used at the power-plant. Forty 20-ft. piles were also driven at the siphon spillway and 4 in the west abutment of Broadway bridge.

Concrete to the extent of 481 cu. yds. was used at the power-plant and spillway and at Baldwin avenue and Argyle street bridges. About 101 cu. yds. of reinforced concrete were also placed at the bridges. At East street, 375 cu. yds. of wash wall were laid.

In metal, 3,175 lbs. were used at junction lock and 6,072 lbs., together with 3,105 lbs. of castings, at bridges, etc.

Contract No. 25.— For prism excavation between a point 0.6 mile north of Comstock post-office and highway crossing at Dunhams Basin; constructing Lock No. 9, spillways, power-plant, etc.

About 19,721 cu. yds. were excavated, of which the dipper-dredge at Parish bridge removed 1,789 cu. yds. of rock; dipper-dredge and Bishop excavator about 1½ miles north of Fort Ann took out 6,121 cu. yds. of earth and rock; the dredge *Champlain* south of Smiths Basin excavated 10,721 cu. yds.; the remainder being 252 cu. yds. borrowed for embankment at Brayton's bridge and 838 cu. yds. at Ft. Ann bridge.

Some 5,303 cu. yds. of embankment were formed, of which 473 cu. yds. were at Brayton's bridge, 729 cu. yds. at Ft. Ann bridge, 2,375 cu. yds. at Henry's bridge, and the remaining 1,726 cu. yds. at the highway at the old wooden lock. About 376 cu. yds. of lining were placed on this highway, besides 45 cu. yds. at Comstock bridge.

About 4,238 cu. yds. of wash wall were built, of which 70 cu. yds. were placed at Comstock's, 232 cu. yds. at Dewey's bridge, 2,587 cu. yds. at Smiths Basin, 282 cu. yds. at Fort Ann, and 1,067 cu. yds. south of Lock No. 9. Some 324 cu. yds. of riprap were also laid north of Ft. Ann.

Concrete was finished at Comstock's, Ft. Ann and Brayton's bridges, temporary bridges removed, scows and drill-boat repaired, etc.

Oswego Canal.

Contract No. 39.— For dredging channel in Oswego river, constructing stream entrances, excavating through Hinmansville cut-off, etc., between Three River Point and Fulton, except portion covered by Contract No. 53.

Dredging was continued, 31,859 cu. yds. of material being removed.

Contract No. 85.— For constructing a steel bridge over the lock at Phoenix.

About 30 cu. yds. of concrete were placed in counterweights and 10,653 lbs. of machinery were installed. Some 3,560 ft. B. M. of sawed lumber were used.

Contract No. 80.— For constructing a concrete dam across the Oswego river at Phoenix.

About 74 cu. yds. of second-class concrete were placed in counterweights, using 5,260 lbs. of reinforcing metal. One gate-hoist was installed at the south head-gates.

Contract No. 104.— For the construction of a reinforced concrete arch bridge over the Barge canal at Broadway, Fulton.

Work not yet begun.

Contract No. 10-A.— For completing the construction of the canal, raising the upper dam, etc., from Broadway bridge, Fulton, south to Contract No. 39.

About 7,050 cu. yds. were excavated, of which 127 cu. yds. were for retaining wall and the balance from prism. Some 3,822 cu. yds. of embankment were formed on the east side. About 173 cu. yds. of concrete were placed in the retaining wall. Some 393 cu. yds. of wash wall were built, of which 300 cu. yds. were at the dike at Yelverton island and the remainder on the east side. At crib No. 3, 5,088 ft. B. M. of sawed hemlock lumber and 55 cu. yds. of stone filling were used and 263 ft. B. M. of white oak were placed in snubbing post.

Contract No. 10-B.— For completing the construction of the canal from the upper end of Lock No. 2, Fulton, north to Contract No. 37.

About 1,500 cu. yds. were excavated and 250 sq. ft. of rock were channeled at Lock No. 3. Some 270 cu. yds. of embankment were formed at the hydraulic canal.

Contract No. 37.— For dredging a channel in Oswego river, constructing Locks Nos. 5 and 6, dams, bulkheads and other structures, and the removal of Battle Island and High dams, between Contract No. 10, at Fulton, and Contract No. 35, at Oswego.

About 2,367 cu. yds. of material were excavated between Contract No. 10 and Lock No. 5, 120 cu. yds. at Minetto retaining wall and dike and 757 cu. yds. from the drainage trench. About 758 cu. yds. of embankment were formed, nearly all at the drainage trench. Some 1,007 lin. ft. of 18-in. and 72 lin. ft. of 6-in. vitrified pipe were laid. About 606 lbs. of plain castings were used and 6 cu. yds. of concrete placed at catch-basins.

On road "B," adjacent, 2,869 cu. yds. of material were excavated, mostly from borrow-pit, and 2,156 cu. yds. of embankment were formed.

Contract No. 79.— For the construction of two spans of a highway bridge over the river at Bridge street, in connection with six other similar spans to be constructed by the city of Oswego.

Final estimates approved by the Canal Board on May 22, 1912.

Contract No. 35.— For prism excavation and constructing Locks Nos. 7 and 8, bulkheads, culverts, spillways, etc., between a point one-half mile above Utica street bridge and harbor line north of Bridge street, at Oswego.

The total excavation was 7,403 cu. yds., of which 1,707 cu. yds. came from the east lower approach to Lock No. 7; 3,848 cu. yds. from prism between locks; 794 cu. yds. from east wall and 1,054 cu. yds. from the east upper approach wall of Lock No. 8. About 178 cu. yds. of embankment were formed at the east lower approach wall of Lock No. 7.

About 2,128 cu. yds. of second-class concrete were laid, of which 776 cu. yds. were in east lower approach of Lock No. 7, 979 cu. yds. in east wall and 373 cu. yds. in the east upper approach wall of Lock No. 8.

Some 9,840 lbs. of structural steel were used in the bridge over Lock No. 7. In lock approaches were also used 245 lbs. of reinforcing metal, 1,554 lbs. of plain castings and 104 lbs. of fender fastenings.

Cayuga and Seneca Canal.

Contract A.— For constructing Lock No. 1 and Dam No. 1, near Cayuga.

Excavating in the bottom of the lock chamber and for the northeast approach wall continued, about 2,198 cu. yds. being removed. About 21,000 ft. B. M. of bracing were placed in the northeast

approach to hold the steel sheet-piling. Gravel arrived in boats on the canal and concreting was resumed on May 27. About 601 cu. yds. were laid in the east wall north of the upper thrust wall. Work on a coffer-dam was started, to enclose the abutment and first two piers at the east end of the retention dam. This will be a double row of sheeting about 12 ft. apart, filled with earth.

Contract B.— For excavating a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from Cayuga lake to Seneca Falls and from Waterloo to deep water in Seneca lake.

The dredge *Clyde* continued working north in the prism, making a cut on the east side, to its junction with the river. It then moved back and began cutting toward the north again on the west side of the prism. About 218,545 cu. yds. were excavated.

Contract H.— For excavating a channel in Cayuga lake inlet at Ithaca from a point about 300 feet north of Cascadilla street, to deep water in Cayuga lake. Contract recently awarded.

Work not yet begun.

Water-Supply.

Contract No. 50.— For constructing dam, waste-gates and spillway across West Canada creek at Hinckley.

At the dam, excavation progressed for foundation of abutments, north gate-chamber, south end of spillway and core wall trenches. For the embankment section, earth was obtained from a borrow-pit east of the south end of the dam by a Thew shovel. Sand and gravel for concrete were excavated from a pit west of the south end of the dam by a Thew shovel. Materials are transported in side-dump cars on standard gage tracks. Third-class concrete was placed in the foundations and core wall. Cyclopean masonry was placed in the east wings of both abutments.

A cableway is being erected at the spillway and coffer-dams were commenced. Quantities: Excavation, 7,622 cu. yds.; sheeting and bracing, 35,121 ft. B. M.; embankment, 15,284 cu. yds.; third-class concrete, 4,117 cu. yds.; Cyclopean masonry, 217 cu. yds.

Contract No. 51.— For constructing a canal feeder from Trenton Falls on West Canada creek to Nine-Mile creek below South Trenton, with gate-house, culverts, highways, etc.

Browning shovel No. 1 continued excavation of feeder prism, spoiling material adjacent. Excavator "K" continued work in the heavy cut. Two traveling derricks, equipped with orange-peel buckets, are also excavating in prism. A small amount has been excavated with teams between the siphon and road culvert. Excavation at road and drainage culverts is being done by hand. Several drainage ditches were excavated. Some of the material was placed within embankment lines. Concrete was laid at drainage and road culverts. Quantities: Excavation, 16,285 cu. yds.; embankment, 300 cu. yds.; sheeting and bracing, 350 ft. B. M.; concrete, 110 cu. yds.; reinforcement, 490 lbs.

Contract No. 55.— For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black River canal, with four locks and aqueduct over Mohawk river, highway change, bridges, etc.

The tow-path along the relocated Black River canal was graded. At Lock No. 7 the tow-path approach to the change bridge was completed and guard-rail erected. Embankments with puddle and stone protection were placed at the ends of the aqueduct and between the aqueduct and Lock No. 7. The remainder of the 30-in. feed-pipe trench was backfilled. The river channel is being excavated with derricks and teams, material being placed in tow-path adjacent to Lock No. 8. Progress was made in completing construction below the dam. Quantities: Excavation, 143 cu. yds.; embankment, 2,397 cu. yds.; puddle, 90 cu. yds.; sawed lumber, 1,570 ft. B. M.; concrete, 74 cu. yds.; dry slope wall, 20 cu. yds.; wash wall, 59 cu. yds.; paving, 78 sq. yds.; structural steel, 369 lbs.; wrought-iron, 172 lbs.; reinforcement, 572 lbs.; castings, 1,830 lbs.; wooden fencing, 624 lin. ft.

On the adjacent highways 1,585 cu. yds. were excavated and 1,261 cu. yds. of embankment formed.

Contract No. 55-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 55, Delta reservoir, to a new cemetery outside the flow lines.

Work was resumed on May 6. Graves were leveled and stone markers set, except those requiring concrete bases. Fencing was delivered and 92 concrete posts were molded.

POWER-SUPPLY.

Contract No. 91.— For building and equipping a hydro-electric power-plant on the Erie canal near the east end of Crescent dam.

Riveting sections of penstock continued. About 58 cu. yds. of concrete were placed. The walls of the substructure and walk on the east side of the power-house were completed. The road from power-house to Northside was repaired.

Contract No. 90.—For constructing hydro-electric power-plants at Baldwinsville on the Erie canal, and at Smiths, Comstock and Whitehall on the Champlain canal. Also for constructing equipment for operating and lighting the following locks: No. 24, Erie canal; Nos. 1, 2, 7 and 8, Oswego canal; Nos. 9, 11 and 12, Champlain canal.

On the Erie canal:

At Lock No. 24, Baldwinsville, very little work was done. Capstan motors were replaced, flexible conduit placed in recesses and metal duct repaired.

On the Champlain canal:

At Lock No. 9, forms were built for concrete floor in power-house, concrete conduit built and metal duct laid on northwest wall, wiring connected and turbines, generators and operating machinery generally reset and adjusted.

At Lock No. 11, the interior of the power-house was painted, motors cleaned and wired and operating machinery adjusted.

At Lock No. 12, interior of power-house and structural steel were painted, concrete surfaces finished and operating machinery adjusted.

On the Oswego canal:

At Lock No. 7, about 252 lbs. of insulated conductors were placed.

Progress of Plans Being Prepared.

The following pages contain detailed accounts of the plans in process of preparation at the main and residency offices, showing progress up to the first of June. An order according to location is followed, as explained in the account of contract work for the month.

Erie Canal.

Contract No. 74.— For dredging Mohawk river from Hudson river to Contract No. 2-E. Plans held for further consideration.

Contract No. 18-A.— For completing the construction of the canal from Mindenville to Castle creek. Plans 83 per cent completed.

Contract No. 84.— For the construction of two steel lift bridges at Clyde, within the limits of Contract No. 47. Work on plans suspended, pending an investigation as to elimination of grade crossing.

Contract No. 59.— For constructing a movable dam in the Genesee river at Rochester. Plans 90 per cent completed.

Contract No. 106.— For the construction of four lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Exchange street, Lockport; Middleport; Prospect street, Medina; Main street, Brockport. Plans 96 per cent completed.

Contract No. 65.— For work from the west end of Contract No. 9, at a point near Beal's bridge, to the east end of Contract No. 64, at a point 600 feet west of Prospect street, Medina, including Oak Orchard creek crossing. Plans 50 per cent completed.

Champlain Canal.

Contract No. 56.— Glens Falls feeder. Plans 86 per cent completed.

Cayuga and Seneca Canal.

The contracts on this canal may be rearranged. For the present the old order is retained.

Contract C.— For constructing Lock No. 2 and Dam No. 2, near Demont's bridge. Plans under revision.

Contract D.— For constructing Lock No. 3 and excavating prism east of Seneca Falls. Plans under revision.

Contract E.— For constructing Lock No. 4 at Seneca Falls, three highway bridges, etc. Plans 70 per cent completed.

Contract G.— For dredging a channel in the Seneca river from Lock No. 4, at Seneca Falls, to Contract B, at Waterloo. Plans 50 per cent completed.

Contract F.— For constructing Lock No. 5 and dam at Waterloo. Plans 55 per cent completed.

Contract I.— For improving the canal from deep water in Seneca lake to Montour Falls, about 2.75 miles. Plans 10 per cent completed.

Contract J.— For improving Glen creek from the highway bridge in the village of Watkins to the canal improvement. Plans under way.

POWER-SUPPLY.

Contract No. 92.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 2, 3, 4, 5, 6 and 7, on the Erie canal, and Locks Nos. 6 and 8, on the Champlain canal. Plans 95 per cent completed.

Plans before Canal Board.

Contract No. 8-A.— For constructing Dam No. 4 and Lock No. 8 at Scotia and other incidental work pertaining to the completion of the locks at Rotterdam and Cranesville. Plans approved by Canal Board, May 8, 1912.

Contract No. 101.— For the construction of a steel highway bridge superstructure at Three River Point. Plans approved by Canal Board, May 29, 1912.

Contract No. 57.—For constructing the canal through Onondaga lake outlet.
Plans submitted to the Canal Board on June 8, 1912.

Contract No. 22-A.— For constructing a new substructure, approach spans and approaches for a bridge over the Erie canal at Weedsport. Plans approved by the Canal Board, May 8, 1912.

Contract No. 103.— For the construction of a reinforced concrete arch bridge over part of the Oswego river at Phoenix. Plans approved by the Canal Board, May 22, 1912.

Contract No. 90-A.— For constructing hydro-electric power-plants, sub-stations and equipments to complete installations at Locks Nos. 1, 2, 7 and 8, Oswego canal. Plans approved by Canal Board, May 8, 1912.

Contracts Advertised.

Contracts Nos. 8-A and 103, described under the preceding heading, are advertised; bids to be opened July 2, 1912.

Award of Contract.

Contract No. 89.— For the construction of five superstructures and one substructure for highway bridges between Lyons and Palmyra on Contracts Nos. 48, 76 and 77. Bids opened May 21, 1912.

Six bids were received, the lowest of which was by the Owego Bridge Co., of Owego, N. Y., to whom it was subsequently awarded at $59,616. The detailed bids appear elsewhere.

RECAPITULATION — PROGRESS ON PLANS.

Contract No.	DESCRIPTION.	Canal.	Progress on plans.
8A	Supplemental to Contract 8	Erie	Advertised.
18A	Mindenville to Castle creek	Erie	83 per cent completed.
22A	Bridge approaches, etc., at Weedsport	Erie	Approved by Canal Board.
56	Glens Falls Feeder	Champlain	86 per cent completed.
57	Onondaga lake outlet	Erie	Before Canal Board.
59	Rochester harbor dam	Erie	90 per cent completed.
65	Canal and aqueduct at Medina	Erie	50 per cent completed.
74	Dredging Hudson river to Contract 2-E	Erie	Under consideration.
84	Two lift-bridges at Clyde	Erie	Suspended.
89	Bridges on Contracts 48, 76 and 77	Erie	Awarded.
90A	Supplemental to Contract 90	Oswego	Approved by Canal Board.
92	Power-house and lock equipments	Erie, Champlain	95 per cent completed.
101	Bridge at Three River Point	Erie	Approved by Canal Board.
103	Bridge at Phoenix	Oswego	Advertised.
106	Bridges on Contracts 61, 64, 65 and 67	Erie	96 per cent completed.
C	Lock 2, near Demont's bridge	Cayuga and Seneca	Under revision.
D	Lock 3 and prism, east of Seneca Falls	Cayuga and Seneca	Under revision.
E	Lock 4 at Seneca Falls	Cayuga and Seneca	70 per cent completed.
F	Lock 5 and dam at Waterloo	Cayuga and Seneca	55 per cent completed.
G	Dredging, Seneca Falls to Waterloo	Cayuga and Seneca	50 per cent completed.
I	Watkins to Montour Falls	Cayuga and Seneca	10 per cent completed.
J	Glen creek at Watkins	Cayuga and Seneca	Under way.

BIDS FOR CONTRACT No. 89.

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		OSWEGO BRIDGE CO., OSWEGO, N. Y.		LUPFER & REMICK, BUFFALO, N. Y.		HOLTON D. ROBINSON, 357 WEST 121ST ST., NEW YORK, N. Y.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.
Coffer-dams, pumping, bailing and draining	lump sum	.....	$500 00	$500 00	$500 00	$500 00	$600 00	$600 00	$500 00	$500 00
Excavation	cu. yd	1,760	75	1,320 00	75	1,320 00	15	264 00	75	1,320 00
Forming embankment for bridge approaches	"	1,590	20	318 00	20	318 00	10	159 00	20	318 00
Lining	"	70	1 50	105 00	1 50	105 00	1 50	105 00	1 50	105 00
Sawed lumber (treated yellow pine)	M. ft. B. M.	22	60 00	1,320 00	60 00	1,320 00	65 00	1,430 00	65 00	1,430 00
Foundation piles	lin. ft	1,760	35	616 00	35	616 00	35	616 00	35	616 00
Second-class concrete	cu. yd	250	7 50	1,875 00	7 50	1,875 00	7 00	1,750 00	7 50	1,875 00
Reinforced concrete	"	490	13 00	6,370 00	13 00	6,370 00	12 00	5,880 00	13 50	6,615 00
Masonry bridge coping, first-class	"	3	30 00	90 00	30 00	90 00	30 00	90 00	35 00	105 00
Structural steel	lb	1,000,000	04½	45,000 00	04	40,000 00	0455	45,500 00	05	50,000 00
Metal reinforcement	"	100,000	03½	3,500 00	03	3,000 00	025	2,500 00	03½	3,500 00
Wood block pavement	sq. yd	970	2 50	2,425 00	2 50	2,425 00	2 50	2,425 00	2 50	2,425 00
Wooden fence	lin. ft	160	20	32 00	20	32 00	20	32 00	20	32 00
Lattice railing	"	940	1 75	1,645 00	1 75	1,645 00	1 75	1,645 00	1 85	1,739 00
Total	.....	.....	.....	$65,116 00	.....	$59,616 00	.....	$62,996 00	.....	$70,580 00

BIDS FOR CONTRACT NO. 89 — (*Continued*).

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		UNITED CONSTRUCTION CO., ALBANY, N. Y.		LANE BRIDGE CO., PAINTED POST, N, Y.		PENN BRIDGE CO., BEAVER FALLS, PA.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.
Coffer-dams, pumping, bailing and draining	lump sum	.....	$500 00	$500 00	$600 00	$600 00	$500 00	$500 00	$600 00	$600 00
Excavation	cu. yd	1,760	75	1,302 00	90	1,584 00	50	880 00	90	1,584 00
Forming embankment for bridge approaches	"	1,590	20	318 00	24	381 60	20	318 00	20	318 00
Lining	"	70	1 50	105 00	1 80	126 00	1 50	105 00	1 50	105 00
Sawed lumber (treated yellow pine)	M. ft. B. M.	22	60 00	1,320 00	72 00	1,584 00	60 00	1,320 00	65 00	1,430 00
Foundation piles	lin. ft	1,760	35	616 00	42	739 20	30	528 00	40	704 00
Second-class concrete	cu. yd	250	7 50	1,875 00	9 00	2,250 00	7 00	1,750 00	9 00	2,250 00
Reinforced concrete	"	490	13 00	6,370 00	15 60	7,644 00	11 50	5,635 00	13 00	6,370 00
Masonry bridge coping, first-class	"	3	30 00	90 00	36 00	108 00	25 00	75 00	30 00	90 00
Structural steel	lb	1,000,000	04½	45,000 00	04	40,000 00	044	44,000 00	043	43,000 00
Metal reinforcement	lb	100,000	03½	3,500 00	03½	3,500 00	03	3,000 00	03½	3,250 00
Wood block pavement	sq. yd	970	2 50	2,425 00	2 75	2,667 50	2 50	2,425 00	2 50	2,425 00
Wooden fence	lin. ft	160	20	32 00	24	38 40	20	32 00	20	32 00
Lattice railing	"	940	1 75	1,645 00	1 75	1,645 00	1 50	1,410 00	2 00	1,880 00
Total	.....	.....	.....	$65,116 00	.....	$62,867 70	.....	$61,978 00	.....	$64,038 00

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Barge Canal Bulletin

Series V No. 7

DEPARTMENT OF

THE STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
ALEXANDER E. KASTL, Special Deputy State Engineer

ISSUED MONTHLY UNDER THE AUTHORITY OF THE STATE ENGINEER, BY THE BUREAU OF PUBLICATION AND REPORTS, DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR

CONTENTS

Progress of Contract Work..... 195
Brief Account of Contract Work for June..... 197
Progress of Plans Being Prepared..... 222
Plans before Canal Board..... 224
Contracts Advertised..... 224
Bids Opened..... 224
Total Amount of Construction Work to June 1, 1912..... 226
Bids for Contract No. 8-A..... 229
Addresses of Barge Canal Contractors..... 232

ENGINEERING DEPARTMENT—Barge Canal.

JOHN A. BENSEL, State Engineer and Surveyor.

ALEX. E. KASTL,
Special Deputy State Engineer.

JOHN A. O'CONNOR,
Terminal Engineer.

THOMAS HASSETT,
Confidential Assistant.

FRANCIS R. CLAIR,
Financial Clerk and Auditor.

ARNOLD G. CHAPMAN,
Chief Clerk.

R. V. SOMERVILLE,
Confidential Clerk

B. J McALLISTER,
Private Secretary.

CONSULTING ENGINEERS:

GEORGE S. GREENE, Jr., MORTIMER G. BARNES, WILLIAM H. BURR,
T. KENNARD THOMSON, JOSEPH RIPLEY.

DIVISION ENGINEERS:

D. B. LA DU,
Eastern Division Engineer.

EDWIN STYRING,
Middle Division Engineer.

E. J. GOVERN,
Western Division Engineer.

GUY MOULTON,
First Resident Engineer, Middle.

SUPERVISING ENGINEERS:

H. D. ALEXANDER,
Special Resident Engineer.

G. F. STICKNEY,
Supervising Engineer.

W. H. YATES,
Supervising Engineer.

BUREAUS:

River Improvement and Locks,
G. F. STICKNEY, Supervising Engineer.

Bridges Metalic Structures and Electrical Equipment,
W. H. YATES, Supervising Engineer,
WM. R. DAVIS, Chief Bridge Designer.
C. C. EGBERT, Expert in Electrical Design.

Other Bureaus,
H. D. ALEXANDER, Spec. Res. Engineer.

Hydraulics,
JOHN P. NEWTON, Assistant Engineer.

Computing and Checking,
F. M. EAMES, Assistant Engineer.

Publication and Reports,
NOBLE E. WHITFORD, Resident Engineer.
Also Editor of *Barge Canal Bulletin*.

Testing Laboratory,
R. S. GREENMAN, Resident Engineer.

CONSTRUCTION RESIDENCIES:

Erie, Residency No. 1,
G. W. STICKNEY, Assistant Engineer.

Erie, Residency No. 2,
S. W. BELDING, Resident Engineer.

Mohawk River Residency,
E. A. LAMB, Resident Engineer.

Erie, Residency No. 3,
E. D. HENDRICKS, Resident Engineer.

Erie, Residency No. 4,
PHILIP H. DATER, Resident Engineer.

Erie, Residency No. 4-A,
EARLE TALBOT, Resident Engineer.

Erie, Residency No. 5,
D. B. DONOVAN, Assistant Engineer.

Erie, Residency No. 6,
D. C. WEDGEWORTH, Resident Engineer.

Erie, Residency No. 7,
EDWARD J. BERRY, Resident Engineer.

Erie, Residency No. 8,
B. E. FAILING, Resident Engineer.

Erie, Residency No. 9,
H. J. KNOPPEL, Supervising Engineer.

Erie, Residency No. 10-A,
J. V. HOGAN, Assistant Engineer.

Erie, Residencies Nos. 10-B and 11,
EDWARD ANDERBERG, Assistant Engineer

Champlain, Residency No. 1,
F. P. WILLIAMS, Resident Engineer.

Champlain, Residencies Nos. 2 and 3,
E. V. R. PAYNE, Resident Engineer.

Oswego, Residency No. 1,
THERON M. RIPLEY, Resident Engineer.

Oswego, Residency No. 2,
JAMES BURDEN, Resident Engineer.

Cayuga and Seneca Residency,
L. S. HULBURD, Resident Engineer.

Cayuga and Seneca Residency,
A. E. STEERE, Resident Engineer

Water-Supply Residency,
L. C. HULBURD, Resident Engineer.

TERMINAL DIVISION ENGINEERS:

CARLETON GREENE,
Southern Division Engineer.

GUY L. NOBLE,
Middle Division Engineer.

Progress of Contract Work.

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to July 1, 1912.
		Put under contract.*	Done to July 1, 1912.	Done during June, 1912.	
1	Empire Engineering Corporation	$580,424	$447,400	0	81.8
2	Ferguson Contracting Company *a*	968,512	694,390	0	73.0
2E	Holler & Shepard *b*	307,023	254,400	$3,270	82.9
3	Sundstrom & Stratton	657,273	633,290	0	Finished.
4	Empire Engineering Corporation	726,780	720,073	0	Finished.
4B	E. J. Doyle & Company	1,351	1,332	0	Finished.
5	Empire Engineering Corporation *a*	156,941	125,820	0	80.2
5A	James Stewart & Company *b*	(317,597)	41,170	41,170	13.0
6	F. A. Maselli	1,026,550	1,033,864	0	Finished.
7	Groton Bridge Company	161,930	98,929	0	Finished.
8	Pittsburg-Eastern Company *a*	1,516,789	920,420	0	60.7
9	Thomas Crimmins Contracting Co	803,297	655,461	0	Finished.
10	McDermott Contracting Company	1,111,965	668,360	0	60.1
10A	The T. A. Gillespie Company *b*	(101,144)	50,570	26,560	50.0
10B	Oswego Construction Company, Inc. *b*	(491,295)	11,700	8,530	2.4
11	Fort Orange Construction Company	1,352,999	1,169,820	7,610	86.5
12	James Stewart & Company	3,555,467	2,458,710	46,810	69.1
13	Penn Bridge Company	28,126	20,180	0	71.7
14	Acme Engr'g & Contracting Company	2,985,225	2,498,830	12,910	83.6
14R	Thomas F. Riley	724	470	0	65.0
15	Atlantic, Gulf & Pacific Company	1,481,692	1,378,956	0	Finished.
16	United Construction Company	78,715	55,650	4,620	70.6
17	The Scofield Company *a*	842,418	57,560	0	Finished.
17	Alexander Murdoch *b*	(812,286)	743,610	0	Finished.
18	Kelley Bros. Contracting Company	611,382	476,979	0	Finished.
19	Great Lakes Construction Company	891,401	733,660	2,020	82.3
20A	Houston Barnard	490,592	257,630	30,940	52.5
20B	S. Pearson & Son, Inc	1,032,210	345,240	23,050	33.4
20C	American Pipe & Construction Co	585,720	482,030	52,720	82.3
20D	American Pipe & Construction Co	2,685,477	104,610	13,630	3.9
21	Lane Brothers Company	1,323,150	421,470	25,810	47.0
22	M. Fitzgerald	127,521	26,840	1,070	21.0
23	Millard & Lupton Company	1,808,797	921,670	36,010	51.0
24	James D. Sherrill	44,368	5,840	0	13.2
25	Atlantic, Gulf & Pacific Company	1,694,037	1,480,380	15,700	87.4
26	Lake Erie Dredging Company	40,057	35,443	0	Finished.
27	Kinser Construction Company *a*	723,269	378,650	0	Finished.
27A	Holler & Shepard *b*	(449,192)	161,530	21,250	36.0
29	Maryland Dredging & Contr'g Co	691,250	415,590	8,270	60.1
30	Acme Engr'g & Contracting Co	2,605,475	1,273,930	96,930	48.9
31	Casey & Murray	831,302	722,540	5,080	87.0
32	Penn Bridge Company	46,797	44,375	0	Finished.
33	Penn Bridge Company	175,537	164,550	0	Finished.
34	M. Fitzgerald	22,449	22,258	0	Finished.
35	Gilmour-Horton-Allen Company	760,917	561,560	13,880	73.7
36	J. D. Miller	46,800	46,800	0	Finished.
37	Henry P. Burgard	2,453,922	994,580	24,130	40.5
38	Henry Tosh & Son	16,870	16,287	0	Finished.
39	James Stewart & Company	1,048,674	199,830	15,790	19.1
40	United Engr'g & Contracting Co	2,252,144	1,730,570	8,890	7.9
41	Butler Bros. Construction Co	273,238	241,644	0	Finished.
42	Shanley-Morrissey, Inc	1,047,366	478,670	0	45.7
43	M. A. Talbot Company	1,365,876	209,840	18,700	15.4
44	Scott Brothers	1,751,479	794,610	42,286	45.4
45	Scott Brothers	472,802	418,652	0	Finished.
46	Kinser Construction Company	1,291,805	693,900	570	53.7
47	Crowell-Sherman-Stalter Company	1,279,328	798,110	0	62.4
48	Crowell-Sherman-Stalter Company	1,670,695	642,600	68,780	38.4
49	American Pipe & Construction Co	735,227	487,920	24,530	66.3
50	Buffalo Dredging Company	974,529	179,990	23,430	18.5
51	Alto Construction Company	392,397	110,360	8,050	28.1
53	Scott Brothers	167,585	164,576	0	Finished.
54	Hunkin-Conkey Construction Co	250,590	117,760	22,300	47.0
55	Arthur McMullen	945,840	878,540	5,520	92.8
55R	Joseph Kalk & Alfred S. Brown	7,561	7,440	1,340	98.4
60	Empire Engineering Corporation	1,491,317	1,272,180	8,810	85.2
61	Cleveland & Sons Company	1,088,890	801,310	26,330	73.7
62	I. M. Ludington's Sons, Inc	2,515,043	1,457,560	57,190	58.0
63	H. S. Kerbaugh, Inc	2,341,198	1,357,500	41,070	58.0
64	Empire Engineering Corporation	1,335,434	769,160	9,900	57.6

Progress of Contract Work—(*Continued*)

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to July 1, 1912.
		Put under contract.*	Done to July 1, 1912.	Done during June, 1912.	
66	Empire Engineering Corporation	854,394	752,630	15,770	88.1
67	Larkin & Sangster	1,149,401	596,280	20,020	52.0
68	Shanley-Morrissey, Inc	1,024,282	946,168	0	Finished.
69	I. A. Hodge & Company	240,061	200,630	1,960	83.6
70	Shanley-Morrissey, Inc	779,636	236,240	0	30.3
71	Shanley-Morrissey, Inc	1,561,119	821,960	0	52.7
72	Shanley-Morrissey, Inc	1,221,112	618,900	0	52.3
73	E. M. Graves	518,829	517,223	0	Finished.
75	United Construction Company	42,917	36,780	0	85.6
76	The T. A. Gillespie Company	1,512,011	733,360	9,960	48.5
77	The T. A. Gillespie Company	1,677,482	992,770	104,190	59.2
78	Cunningham-Woodard Company	49,026	47,723	0	Finished.
79	Lupfer & Remick	37,480	33,980	0	Finished.
80	Walter Bradley	117,391	109,570	430	93.3
82	Groton Bridge Company	28,841	21,320	0	73.9
85	Lupfer & Remick	13,151	12,010	10	91.3
86	Lathrop, Shea & Henwood Company	43,440	4,940	0	11.3
88	Lathrop, Shea & Henwood Company	25,658	190	190	0.7
89	Owego Bridge Company	59,616	0	0	0.0
90	D'Olier Engineering Company	180,318	168,260	4,620	93.4
91	The Hollington Company	44,985	16,540	2,880	36.8
104	R. B. Murdock	39,370	200	0	0.5
105	Skene & Richmond	258,710	3,970	3,970	1.5
	Totals	$73,864,726	$45,719,773	$1,068,810	.....

Cayuga and Seneca Canal.†

A	Scott Brothers	$357,627	$158,890	$21,950	44.4
B	Crowell-Sherman-Stalter Co	1,436,597	589,530	29,010	41.0
H	James H. Dawes	205,649	0	0	0
	Totals	$1,999,873	$748,420	$50,960	.....

* Includes all alterations in force to date. *a* Suspended by order of the Canal Board. *b* Relet to complete former contracts, contract price not included in total. † Authorized by separate appropriation.

Brief Account of Contract Work for June.

The following pages show what has been done during the month on the several contracts now in force on the Barge canal. The Erie canal contracts are described in order from Waterford west to Buffalo, and the Champlain and Oswego canal contracts follow, in order from south to north, while the Cayuga and Seneca canal contracts are given from east to west.

Erie Canal.

Contract No. 33.— Lock-gates and valves, guard-gates, etc, on Contracts Nos. 2, 10, 11 and 15.

Contract completed. Final estimates being prepared.

Contract No. 16.— For eleven steel highway bridges, ten of which are at various points on Contracts Nos. 25 and 27, Champlain canal, and the remaining one on Contract No. 11, Erie canal.

On Contract No. 27-A, painting progressed on East street bridge; material for falsework was hauled to Argyle street bridge.

On Contract No. 25, painting was done on Smiths Basin bridge; at George Henry's bridge, progress was made in erecting steel, laying floor and setting coping. About 89,000 lbs. of steel were placed. This finishes the work embraced in Contract No. 25.

Contract No. 13.— For three bridge superstructures on Contract No. 12 and two on Contract No. 18.

No contract work was done.

Contract No. 2-E.— For completing the construction of the canal from the Mohawk river at Waterford to a point about one-fourth mile above the head of Lock No. 3.

From below Lock No. 2, some 3,659 cu. yds. of material were dredged from the prism, 1,809 cu. yds. of which were placed as backfill behind the south approach of the lock and the balance spoiled at the Troy dam. Work on cribs below the lock comprised the use of 1,200 ft. B. M. of yellow pine timber, 1,656 lin. ft. of round timber and 266 cu. yds. of stone filling. About

200 lin. ft. of fenders were placed on the south approach to the lock.

Contract No. 11.— For prism excavation and construction from Contract No. 2 to Mohawk river below Crescent, including Locks Nos. 4, 5 and 6, highway, bridge abutments, guard-gate, masonry, etc.

About 1,336 cu. yds. of concrete were placed as follows: In the south retaining wall at Mohawk river, completing it, 221 cu. yds.; south docking between Locks Nos. 4 and 5, 796 cu. yds.; north docking between Locks Nos. 5 and 6, 260 cu. yds.; snubbing posts on south side below Lock No. 4, 33 cu. yds.; snubbing posts on south side at Mohawk river, 26 cu. yds.

Cleaning up prism below Lock No. 4 was continued, excavated material being placed as embankment behind north retaining wall. The Bucyrus shovel removed about 1,600 cu. yds. from the by-pass of Lock No. 6 and 400 cu. yds. from prism below lock. All this was placed as embankment on the south side of Lock No. 4. The Vulcan shovel removed about 3,000 cu. yds. from the rock cut which was placed as embankment on the south side of Lock No. 4 and in spoil above Lock No. 6. Excavation was made for 5 piers on the south side between Locks Nos. 5 and 6. About 5,500 lin. ft. of drilling and 765 sq. ft. of channeling were done in rock cut.

Contract No. 14.— For work from Contract No. 11 to a point near Rexford Flats aqueduct, including Lock No. 7 and Dams Nos. 2 and 3; also for constructing Locks Nos. 13, 14 and 15, Dams Nos. 9, 10 and 11, Mindenville retaining dam, etc.

At Dam No. 3, Lock No. 7, Vischer's Ferry, about 1,100 cu. yds. were excavated from site of Dam " E " and the intersections with Dam " F." Also about 100 cu. yds. were removed by the scraper tower and 400 cu. yds. by derrick-boat from prism below Lock No. 7. Some 1,200 cu. yds. of embankment were placed at core wall and about 700 cu. yds. at wing wall of Lock No. 7. About 970 cu. yds. of concrete were placed in Dam " E " and 50 cu. yds. in core wall at Vischer's Ferry. At Lock No. 7, 60 cu. yds. of wash wall were placed on the downstream side of the wing wall and 175 cu. yds. on the upstream side. Painting was completed on head-gates, the Stoney gate and needle-dam.

At Dam 9, Lock No. 13, Yosts, some painting of steel work was done, walks were laid and some of the plant shipped away. Quantities: Sawed lumber, 673 ft. B. M.; metal in needle-dams, 3,567 lbs.

At Dam No. 10, Lock No. 14, Canajoharie, the embankment back of the river wall was completed, ballast was placed and the laying of second-class stone paving is progressing. The painting of bridge and dam is completed. Quantities: Embankment, 2,223 cu. yds.; paving, 147 sq. yds.; ballast, 25 cu. yds.; metal in uprights for dam, 6,767 lbs.; metal in gates for dam, 15,139 lbs.; pipe railing, 57 lin. ft.

Contract No. 14-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 14 to new burial plots outside the flow lines.

No work was done.

Contract No. 20-D.— For dredging Mohawk river channel, constructing stream entrances, etc., between deep water below Rexford Flats aqueduct and center of bridge at Dam No. 9, at Yosts.

The dipper-dredge removed about 26,496 cu. yds. of material from the prism, spoiling it by means of scows in the south channel opposite the Shuttleworth mills. Dikes were constructed in advance of the hydraulic dredge at Randall and on Gardinier's island at Amsterdam. The work of installing machinery on the new hydraulic dredge at Amsterdam was continued. A new scow of 250 cu. yds. capacity was launched and placed in commission.

The gap in the old coffer-dam at Tribes hill has been closed and about 160 cu. yds. of loose rock were excavated in prism. At Danascara creek entrance about 590 cu. yds. were excavated and a few cu. yds. of riprap were laid. At Auries creek about 177 cu. yds. were excavated.

Contract No. 8.— For constructing Dam No. 4 and Lock No. 8, at Scotia; Dam No. 5 and Lock No. 9, at Rotterdam; Dam No. 6 and Lock No. 10, at Cranesville, all on the Mohawk river.

Final estimates being prepared.

Contract No. 17.— For constructing Dam No. 7 and Lock No. 11, at Amsterdam, and Dam No. 8 and Lock No. 12, at Tribes Hill.

Completed tests of gates and uprights at Dam No. 7. At Dam No. 8, 12 pairs of uprights were lowered, but were not properly seated because of gravel on the sill. The uprights were again raised and material is being removed from the sill.

Contract No. 20-C.— For dredging Mohawk river channel, constructing stream entrances, etc., between center of bridge at Dam No. 9, at Yosts, and center of bridge at Dam No. 10, at Canajoharie.

The hydraulic dredges continued excavation in river prism, moving downstream to near Yatesville creek, placing 6,338 cu. yds. in spoil on the Florence Keck parcel and 71,143 cu. yds. on the N. Y. C. R. R. and Nellis spoil area north of Yatesville creek. The dipper-dredge also operated in prism, placing its output in dump-scows and spoiling it in deep water. About 24,957 cu. yds. of material were so spoiled.

At Canajoharie stream entrance, about 15 sq. yds. of paving and 35 cu. yds. of riprap were laid. At Flat creek stream entrance 356 cu. yds. were excavated and 10 sq. yds. of paving and 12 cu. yds. of riprap were laid. Another tug was placed in commission. Stone was quarried and delivered at Yatesville creek entrance.

Contract No. 86.— For the construction of one span of a highway bridge over the Mohawk river at Canajoharie, to replace two existing spans, which will be removed.

Piles were driven and timber bents framed for supporting the north end of the second span while the old pier is being removed and the new one built. Some 49 piles were driven. About 1,800 lin. ft. of hard wood piling and 15,000 ft. B. M. of timber and plank for falsework were delivered.

Contract No. 20-B.— For dredging Mohawk river channel, constructing stream entrances, etc., between the center of bridge at Dam No. 10, at Canajoharie, and the upper miter wall of the new lock at Mindenville.

The two dipper-dredges and the hydraulic disposal boat worked a few shifts after which one of the dipper-dredges moved below the bridge and began casting over to the north bank of the river, building dikes for spoil area. During the month the other dipper-dredge and the disposal boat passed under the bridge and began stripping the rock in prism. About 37,177 cu. yds. were

placed on the D. M. Place and the N. Y. C. R. R. Co. parcels and the spoil area on the north side of river below the bridge. During the month the orange-peel dredge placed coarse material along the banks above the bridge. This work is complete, which practically finishes the contract west of the highway bridge. About 902 cu. yds. were excavated at Otsquaga creek.

Contract No. 20-A.— For dredging Mohawk river channel, etc., between Castle creek and upper miter wall of lock at Little Falls.

West of Castle creek, excavating for wash wall on north side progressed. East of the creek the orange-peel bucket machine excavated in prism, spoiling most of the material in the creek or back of the north embankment. The hydraulic dredge *Indian Castle* continued excavating in river, east of suspension bridge, spoiling most of the material on south side and the remainder in the old canal on the Garlock farm. A few cu. yds. of wash wall were laid in the bottom on the north side. Quantities: Excavation, 38,519 cu. yds.; wash wall, 51 cu. yds.

Contract No. 31.— For improving the Erie canal at Little Falls, constructing Lock No. 17, and modifying the dam and constructing guard-gates at Rocky Rift.

Excavation for riprap and lining at rear of tow-path west of the Adirondack mill was made. Stone were cut for the dry wall and some broken for riprap at the excavation on south side of prism. Excavation on south side for retaining wall west of German street, and that for dry wall west of guard-gate, was completed. A small amount was excavated in prism.

About 292 cu. yds. of embankment were placed behind various retaining walls. Some 2,000 ft. B. M. of white oak were used in lock gate fenders, lower gate seal and upper gate buffer-blocks. About 272 cu. yds. of concrete were laid, completing the wall on south side west of German street. The dry wall in front of the Adirondack mill was completed.

Hansen avenue bridge received two coats of paint. The Indian Castle guard-gates were tested and accepted. Iron railing on retaining wall No. 3 was placed and painted. At Rocky Rift dam a coffer-dam for the middle section was built and unwatered. The timber work at the grain elevator was demolished. Seeley street roadway approach was partly graded.

Quantities: Excavation, 1,855 cu. yds.; dry wall, 268 cu. yds.; riprap, 39 cu. yds.; metal in guard-gates, 3,329 lbs.; railing, 296 lin. ft.

Contract No. 30.— For dredging channel in Mohawk river and land line from Little Falls to Sterling creek, constructing Lock No. 18 at Jacksonburg, Dam No. 14 and guard-gates at Herkimer, retaining dam at Frankfort, bridges, etc.

At the guard-gate and Dam No. 14, the Thew shovel, on double shifts, excavated for highway bridge abutments, placing some of the material in the coffer-dam at Dam No. 14 and the remainder in the detour of the U. & M. V. R. R. around the easterly side of the guard-gate. The work here was delayed owing to changes in plans, etc. of the R. R. Co. The coffer-dam is completed, ready to pump out. General plant has been erected here.

At Ilion, tower No. 2 built dikes from material excavated from prism. The Ilion highway bridge has been raised and temporary work placed so that the bridge can be moved 50 feet south to permit the 20-in. dredge to pass. The dredge, operating on triple shifts, has removed about 167,000 cu. yds. to spoil on released land south of the river.

At East Schuyler bridge, plant has been erected and material delivered for building the abutments.

East of Frankfort, at tower scraper No. 4, some filling was done in old river channel, using material from adjacent spoil banks. The derrick sloper continued work on the north bank.

At Little Falls, the plant at the rock excavation has been moved to a new location about 3,000 ft. west of the old one. Coffer-dams were placed above and below a new river section and are now being sheeted and filled. Pumping will begin early in July. A plant for compressed air is being installed for rock excavation.

At Jacksonburg, the Thew shovel completed dikes on Eysaman island. The dredge *Herkimer,* on triple shifts, excavated 69,113 cu. yds. of soft material from the canal prism, spoiling it along the Erie canal.

At Lock No. 18, the riprap at the easterly end of the north lock wall was completed. Excavation is being made in the lock chamber and spoiled behind the south lock wall and upper guide wall. The lower gates have been riveted and painted one coat. The upper gates and buffer-beam are practically finished. The

white oak for the upper gates is nearly framed and a few pieces were placed.

From Lock No. 18 to Fort Herkimer, traveling derrick No. 414 placed 6,000 cu. yds. of borrowed material in the south embankment. Tower scraper No. 5 grubbed north embankment. Wash wall is nearly completed. The south drainage ditch from Erie canal culvert No. 75 has been excavated. Tower scraper No. 1 graded the top of the north embankment and excavated part of the wash wall notch, the remainder being completed by hand.

At Fort Herkimer, progress was made on the wash wall.

Quantities: Excavation, 255,695 cu. yds.; embankment, 8,322 cu. yds.; white oak lumber, 1, 083 ft. B. M.; wooden sheet-piling, 50,840 ft. B. M.; wash wall, 843 cu. yds.; riprap, 586 cu. yds.; metal in gates, 24,142 lbs.; in valves, 612 lbs.; in buffer-beam, 2,936 lbs.

Contract No. 29.— For excavating prism from Sterling creek to Oneida-Herkimer county line, constructing lock at Sterling creek, bridges, etc.

From Sterling creek inlet channel and dam 2,980 cu. yds. were excavated and from dive culvert 308 cu. yds. At the culvert 1,100 ft. B. M. of sheeting and bracing and 500 lin. ft. of round timber were used. Of embankment 1,817 cu. yds. were formed on south side of prism, half of which was retained for trimming and finishing. Some 30 cu. yds. of lining were placed at the dive culvert. About 1,428 sq. ft. of steel sheet-piling were driven at Lock No. 19.

Some 736 cu. yds. of second-class concrete were laid, of which 50 cu. yds. were in main lock walls, 227 cu. yds. in lock invert and breast wall and 459 cu. yds. at dive culvert. About 433 lbs. of structural steel and 156 lbs. of reinforcement were used at Lock No. 19. About 9,102 lbs. of reinforcing metal were also used at the dive culvert.

Considerable bank trimming was done with teams between Day's culvert and Budlong creek. Burch culvert is nearly complete. The steam-shovel was taken from Sterling creek entrance for use in backfilling N. Y. C. R. R. abutments. Plant no longer needed on railway work has been erected elsewhere or shipped.

Contract No. 42.— For prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillway, stream entrances, culverts, etc.

Work continues suspended pending further action by the Canal Board.

Contract No. 43.— For constructing the canal from a point just south of Oriskany road to about 1,500 feet west of Mud creek.

The dredge *Stanwix* removed 93,681 cu. yds. of material from the prism.

Contract No. 44.— For constructing the canal from about 1,500 feet west of Mud creek, west of Rome, to about three miles west of New London, including junction lock, Locks Nos. 21 and 22, bridges, culverts, spillways, stream entrances, etc.

The total excavation for the month was 66,989 cu. yds. of which shovels Nos. 1347 and 883 removed 27,811 cu. yds., shovel No. 841, 21,619 cu. yds., tower scraper No. 2, 10,068 cu. yds. and teams, 2,799 cu. yds., all from the prism; derricks and teams at Lock No. 21, tower scraper No. 1 and derrick at Lock No. 22, 3,359 cu. yds.

At Lock No. 21, about 5,543 sq. ft. of steel sheet-piling were used in south lower approach wall, 216 lin. ft. of foundation piles driven, 3,859 cu. yds. of second-class concrete laid, and 1,866 lbs of structural steel, 98 lbs. of metal reinforcement, 1,515 lbs. of steel castings, and 1,243 lbs. of metal in buffer-beams placed.

At the culvert, 84 sq. yds. of second-class stone paving and 18 cu. yds. of lining were placed.

Contract No. 12.— For excavating prism between Oneida lake and Mosquito Point bridge on Seneca river; constructing Lock No. 23 and other structures.

Hydraulic dredge No. 1, working intermittently, where material would permit, removed about 38,400 cu. yds. Dipper-dredge No. 4 excavated about 16,500 cu. yds. Dipper-dredge No. 7, working near Oak Orchard bridge and later making slopes in cut at the big bend, removed about 91,200 cu. yds. At Brewerton cut, ladder-dredge No. 2 is being put in shape for work. At Lock No. 23 work has progressed rapidly, about 2,200 cu. yds. of concrete

being deposited in north and south walls. Castings and anchorages for buffer-beams were placed.

On the western end of the contract, dredge No. 5 only has been working part of the time.

Quantities: Excavation, 134, 351 cu. yds.; concrete, 2,766 cu. yds.; structural steel, 869 lbs.; metal in lock-gates, 170 lbs.; metal in needle-dam, 7,075 lbs.; reinforcement, 3,124 lbs.

Contract No. 22.— Bridges on Contract No. 12.

At Free bridge, coffer-dams at south abutment were repaired, some excavation made and steel sheeting driven on west wing.

At Bonta's bridge, the north span has been painted as far as erected. Wheel-guards were fitted and 7 panels of flooring laid. Some excavation was made at pier No. 1 and steel sheeting is being driven with much difficulty.

At Jordan bridge, some excavation was made and lining placed. Backfilling was also done. Concreting west abutment is completed and forms removed.

Quantities: Sawed lumber, 8,978 ft. B. M.; structural steel, 1,736 lbs.

Contract No. 46.— For the construction of the canal from Fox Ridge to the southeast corner of the town of Galen, including Lock No. 25, a movable dam at May's Point, bridges, etc.

Concrete was placed in the north abutment of the movable dam at May's Point. At the County Line bridge, excavation for the back-posts was completed and the footing course laid.

At Lock No. 25, erection of plant continued. Pumping from the pit was done. Steel sheet-piling was driven at the east coffer-dam.

Contract No. 47.— For the construction of the canal from the southeast corner of the town of Galen to a point near the N. Y. C. & H. R. railway crossing at Lyons, including Lock No. 26, a dam across the Clyde river, highway bridge, stream entrance, etc.

Very little work was done during the month.

Contract No. 5-A.— For the completion of Contract No. 5, from Mosquito Point to Campbell's bridge, including construction of Owasco creek entrance, reconstruction of bridge at

Mosquito Point and new pier and approaches at Howland island bridge, etc.

The temporary roadway was completed and the steel bridge removed from over the prism. Excavating began at north abutment and for riprap at south abutment. Repairs to old bridge over Owasco creek were completed, roadway graded and repaired and a temporary bridge of pile bents erected across the canal channel to maintain highway traffic. Dredge No. 5 operated part of the month. A cut through into the canal channel was made. Quantities: Excavation, 29,389 cu. yds.

Contract No. 89.— For the construction of five superstructures and one substructure for highway bridges between Lyons and Palmyra on Contracts Nos. 48, 76 and 77.

Recently awarded. Contract work not yet begun.

Contract No. 48.— For the construction of the canal from a point near the N. Y. C. & H. R. railway crossing at Lyons to a point near the West Shore railway crossing at East Newark, including Locks Nos. 27 and 28-A, dam and power-house, retention dam across Canandaigua outlet, spillway, culverts, highway, bridge, approaches, etc.

The dipper-dredge continued its work at the eastern end of the contract, loosening material to be rehandled by the suction dredge. The total excavation for the month was 72,097 cu. yds., of which the dredge *Lyons* removed about 40,000 cu. yds. in the vicinity of Lock No. 27, the Marion shovel 12,900 cu. yds. in prism at the " blue cut " and the Browning crane 9,600 cu. yds. west of the N. Y. C. R. R. bridge, the remainder being removed at Lock No. 28-A and at Geneva street.

During the month the spillway at the cut, the abutments at Geneva street and the south wall of the lower approach of Lock No. 28-A were completed. About 451 cu. yds. of second-class concrete were laid in Geneva street abutments, 479 cu. yds. at the spillway and 2,212 cu. yds. at Lock No. 28-A. The Poor-house bridge was riveted and painted. Abuot 1,279 cu. yds. of wash wall were laid between the cut and the N. Y. C. R. R. bridge.

Contract No. 76.— For the construction of the canal from a point near the West Shore railway crossing at East Newark to a point about one-half mile of Port Gibson.

No prism excavation was made. About 2,987 cu. yds. were excavated for the highway change at Peek's and 2,439 cu. yds. from ditches back of spoil. At Lock No. 28-B, 50 cu. yds. of concrete were placed and the work of erecting gates and setting quoin-plates started. Some 272 cu. yds. of concrete were placed in the bridge abutments below this lock. At Newark dock, 591 cu. yds. of concrete were laid in the main wall. Erection of plant at the spillway began.

Contract No. 77.— For constructing the canal from one-half mile east of Port Gibson to one-half mile west of Palmyra, including Lock No. 29, power-plant, bridges, culverts, etc.

In the prism, the suction dredge *Palmyra* operated during the month, cutting to the depth of the berme in the big cut and taking out 166,972 cu. yds. of material.

At Port Gibson bridge, 280 cu. yds. were excavated by hand, 3,636 lin. ft. of foundation piles driven and 361 cu. yds. of concrete laid.

At Galloway's bridge, the substructure is nearing completion. About 97 cu. yds. of second-class and 13 cu. yds. of reinforced concrete were placed and 530 lin. ft. of foundation piles driven.

The approaches for Limerick and Maple Avenue bridge are practically complete. At Lock No. 29 work has progressed rapidly. Steam-shovel No. 20 excavated 29,793 cu. yds. from approaches and prism and 3,819 cu. yds. of second-class concrete were placed.

Contract No. 49.— For prism construction from a point about 500 ft. east of Yellow Mills bridge, about one mile west of Palmyra, to the Monroe county line, including Lock No. 30, sluice-gates, highway bridges, culverts, etc.

The highway bridges at Frear's and Wayneport were painted. Work was started on the bridge at Lock No. 30. About 3,400 cu. yds. of concrete were placed in the lock and abutments to bridge below. Some 1,146 lin. ft. of foundation piles were driven for the upper approach wall of the lock. General repairs, pumping and erection of plant have continued through the month.

Contract No. 63.— For enlarging present canal and constructing culverts, sluiceways, waste-weir, guard-gates, dock walls,

bridges, highway changes, etc., between Wayne-Monroe county line and Kings Bend.

The hydraulic dredge *Fairport* continued prism excavation, pumping material to adjacent spoil area. The Lidgerwood excavator continued operating on north side of prism, casting material into adjacent embankment and spoil. Excavation with teams and scrapers was done at new Thomas creek ditch and drainage ditch on south side east of Mitchell's bridge. A small amount of concrete was placed in north abutment of Cartersville bridge, in north approach slabs of Parker, Main and State street bridges and for sidewalks. Stone paving was placed at south end of culvert No. 28. Riprap was placed at north end of this culvert and also on south slope of new embankment at Cartersville. Considerable coping-stone was placed on wash wall.

In steel structures: Parker street bridge was riveted and painted; Fullam's Basin bridge was painted; falsework was erected at Cartersville bridge. At Cartersville guard-gate, the work of strengthening the guides has been under way the entire month. Slopes and tow-path have been trimmed and lining placed on the latter.

Quantities: Excavation, 67,884 cu. yds.; second-class concrete, 156 cu. yds.; reinforced concrete, 148 cu. yds.; embankment, 13,709 cu. yds.; riprap, 3,110 cu. yds.; wash wall, 222 cu. yds.; lining, 409 cu. yds.

Contract No. 23.— For prism excavation between Kings Bend and Genesee river and construction of Locks Nos. 32 and 33, guard-lock, bridges, culverts, etc.

Pumping was maintained at Lock No. 23. Steam-shovels Nos. 1178 and 2449 continued excavating in prism between East Henrietta and Westfall roads, most of the material being spoiled in north approach to South avenue bridge or on north bank west of this point, a small portion being placed east of the bridge approach. Shovel No. 692 excavated in prism east of Kingsley road and for lower guide wall and by-pass of Lock No. 32, material being sent to the west end of adjacent Contract No. 62 for embankment and spoil. Excavation by orange-peel bucket was made in pit for retaining wall in front of north abutment of West Henrietta road bridge, and by hand or teams in drainage ditches and for upper guide wall and spillway and Edgewood road culvert at Lock No. 33. A start was also made excavating

the wash wall notch on north side of cut. At the north retaining wall of West Henrietta bridge considerable trouble was had by reason of unstable material and both wooden and steel sheet-piling were driven here. Additional lining was placed on the relocated Westfall road.

About 3,020 cu. yds. of second-class concrete were placed in Lock No. 33, upper guide wall and lower spillway, adjacent structures in retaining wall in front of skewbacks of East Henrietta road bridge and also for capstan settings at lower guide wall of Lock No. 33.

Wooden fence has been built and painted at approaches of Kingsley road, Edgewood avenue and East Henrietta road bridges, over the first two of which traffic has been turned. A concrete plant was erected at the latter bridge.

Quantities: Excavation, 52,053 cu. yds.; metal reinforcement, 10,670 lbs.; wooden fencing, 880 lin. ft.; piling and bracing, 1,070 ft. B. M.; foundation piles, 514 lin. ft.; lining, 140 cu. yds.

Contract No. 21.— For prism excavation and construction of bridge abutments, guard-lock, etc., from the Genesee river west 2.56 miles to a point just west of the N. Y. C. & H. R. railway crossing.

Pumping for drainage continued. Shovel No. 3 worked the entire month in the rock cut and shovel No. 4 started in earth cut at the west end of contract, all material being sent to spoil banks. The locomotive crane worked part of the month clearing the channeled section near the P. R. R. crossing. At the guard-lock, placing concrete progressed. Another stone-crusher and mixer were set up. Fourteen steam-drills were in operation ahead of the shovel. Four channelers were also in operation. Quantities: Excavation, 41,122 cu. yds.; concrete, 703 cu. yds.

Contract No. 82.— For furnishing and erecting three steel highway bridge superstructures on Contract No. 21, near Rochester.

No work was done. The substructures are not yet ready.

Contract No. 75.— For construction of three guard-gate superstructures on Contracts Nos. 60, 61 and 64.

At the Spencerport guard-gate, machinery was adjusted and channel tracks stiffened.

At the Brockport guard-gate, a small amount of painting on the superstructure was done, machinery adjusted and tracks strengthened.

Contract No. 105.— For the construction of five lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Union street, Spencerport; Washington street, Adams Basin; Park avenue, Brockport; Hulberton; Gasport.

At Adams Basin, Washington Street bridge, steel sheet-piling was driven in front of both abutment pits and the pits sheeted, braced and excavated nearly to rock foundation. The old concrete wall on the south side was removed. Considerable material and plant are at the site.

At Brockport, Park Avenue bridge, plant and material was delivered and steel sheet-piling driven for coffer-dam on south side enclosing a section for continuation of the vertical wall.

Contract No. 60.— For prism excavation and construction of culverts, bridge structures, etc., between a point 1.75 miles east of South Greece and a point 0.5 mile west of Adams Basin.

The ladder-dredge *Mohawk* continued excavating in prism just west of Union street, Spencerport, disposing of its material in adjacent embankment or sending it in Koppel cars to north embankment east of the dredge. The derrick-scow also operated part of the time in prism west of cut-off at South Greece, spoiling material adjacent. Teams and scrapers graded tow-path and formed embankment in various places. The north approach of bridge No. 95 was trimmed. Considerable puddle was placed in the bottom by dumping from a scow just east of this bridge. Wash wall was built and coping placed. Lining was placed on tow-path and on new highway on north side west of bridge No. 99.

Quantities: Excavation, 4,092 cu. yds.; embankment, 4,891 cu. yds.; wash wall, 1,189 cu. yds.; lining, 407 cu. yds.; puddle, 1,186 cu. yds.

Contract No. 61.— For prism excavation and construction of culverts, bridges, waste-weir, etc., between a point 0.5 mile west of Adams Basin and Monroe-Orleans county line.

Excavator No. 1 began work June 17, removing the old berme bank east of the new guard-gate, placing material on south em-

bankment just within the east line of Brockport. Excavator No. 2 worked on north bank of prism about one-third mile east of culvert No. 57, clearing up the prism as it advanced and disposing of material partly in adjacent north bank, the remainder being towed by scows about one-half mile west where a clam-shell derrick placed it in the south embankment. Excavator No. 3 was idle. Considerable wash wall was built and lining placed on tow-path at various points. Bridges Nos. 109 and 110 were painted and forms for concrete sidewalks were placed at the former. Guard-rail is being built at bridges Nos. 104 and 106.

Quantities: Excavation, 9,660 cu. yds.; embankment, 8,012 cu. yds.; wash wall, 5,894 cu. yds.; lining 1,439 cu. yds.

Contract No. 62.— For prism excavation and construction of culverts, bridge substructures, etc., between Orleans-Monroe county line and a point near Eagle Harbor bridge.

Albion section:

About 24,500 cu. yds. were excavated, including work by team outfit at Brockville bridge, McMyler excavator in ditch to culvert No. 73, Bucyrus excavator with drag-line on south side between culverts Nos. 75 and 76, Lidgerwood excavator west of Lattin's bridge and for Ingersoll street abutments.

About 12,800 cu. yds. of embankment were formed, by the Bucyrus and Lidgerwood outfits. About 466 cu. yds. of second-class concrete were placed at Albion vertical wall and in south head wall of culvert No. 82, where 25 cu. yds. of third-class concrete were also placed. Reinforced concrete slabs were laid at Hall's, Gaines Basin and Bidwell's bridges, aggregating 130 cu. yds. About 2,600 cu. yds. of wash wall were built at various points.

Miscellaneous: 12,000 lbs. of cast-iron pipe were placed at culvert No. 82; 15,000 lbs. of metal were used with reinforced concrete; steel is on the ground for Gaines Basin bridge; Brockville bridge is being painted.

Holley section:

About 18,500 cu. yds. were excavated, by shovel No. 4 removing quarry chips west of McGuires bridge, from borrow-pit at County Line bridge, material for approaches, wash wall notch and sloping prism. About 8,700 cu. yds. of embankment were formed in bringing both banks to lines at various points. Some 24 cu. yds. of second-class concrete were placed in culvert at north ap-

proach of County Line bridge, and 78 cu. yds. of reinforced concrete, using 8,400 lbs. of metal, were placed in slabs at Orr's and County Line bridges. About 4,400 cu. yds. of wash wall were built west of McCarthy's bridge, and 3,700 lbs. of iron railings were placed at County Line, Orr's, Tuttle's and McGuire's bridges. At the latter bridge 1,300 lin. ft. of fencing were built on the approaches.

Contract No. 64.— For improvement from 600 ft. west of Prospect street, Medina, to 100 ft. east of Gasport bridge.

About 5,387 cu. yds. were excavated, by a small dipper-dredge, derrick-boat, team outfit and for wash wall notch. About 5,702 cu. yds. of embankment were formed, by derrick-boat and tugs and scows on tow-path side. Coping was laid, wall filled and knapped on 2,179 cu. yds. of wash wall. Machinery was installed in large dipper-dredge and boats were repaired. Wooden fence was rebuilt.

Contract No. 66.— For prism excavation and constructing bridges and approaches, culverts, etc., from 100 ft. east of Gasport bridge to 600 ft. east of Lockport locks.

The total amount excavated was 3,185 cu. yds. and 2,085 cu. yds. of embankment were formed. At Gasport, a dipper-dredge, transferred from Contract No. 64, completed excavating east of the bridge, removing 172 cu. yds. Some 438 cu. yds. of embankment were placed behind Gasport retaining wall.

At Wakeman's bridge, 950 cu. yds. of lining were placed on approaches, and 425 cu. yds. were spread at various places along the tow-path. The wash wall required on the contract was practically completed, 771 cu. yds. being built during the month.

Work on the new approach to Lake Avenue bridge began, 1,637 cu. yds. being excavated and 67 cu. yds. of concrete laid in the retaining wall. At Lockport 621 more steel sheet-piles were driven, completing the work.

Contract No. 67.— For construction of Locks Nos. 34 and 35 and approaches, etc., at Lockport.

The total excavation amounted to 2,660 cu. yds. In Locks Nos. 34 and 35, 182 cu. yds. were removed in trimming to lines for foundations. The Thew shovel and teams completed stripping rock for Main street bridge abutments. Later, hand labor and a

derrick continued rock excavation, loading the output into boats which were taken to the 60-mile level for wash wall. In all, 2,478 cu. yds. of earth and rock were removed for these abutments.

About 1,771 cu. yds. of concrete were placed in sections of the lower end of Lock No. 34 and 70 cu. yds. were placed in foundation on south side of Lock No. 35.

The Transit street bridge was thrown open for traffic on the last day of the month. Some 20,785 ft. B. M. of creosoted lumber and 478 sq. yds. of wood block pavement were laid to complete this roadway. A four-hoist traveler and trestle runway are being erected, the latter to extend the length of the two locks, to be used for excavating and concreting.

Contract No. 40.— For constructing the canal, culvert entrances, guard-gates, stream entrances, bridges, etc., from the Lockport locks to Sulphur Springs guard-lock.

At Summit street bridge 96 cu. yds. were excavated for the south abutment and 33 cu. yds. of reinforced concrete were placed in the slabs on both sides. Some 2,000 lbs. of structural steel were estimated for the superstructure, completing it.

At Riley's bridge 280 cu. yds. were placed in embankment; 24 cu. yds. of lining were placed in the approaches; 2,000 ft. B. M. of sawed lumber and 264 sq. yds. of wooden paving were placed on the floor.

At Hawley's bridge 130 cu. yds. were excavated; 259 cu. yds. of embankment were formed and 8 cu. yds. of lining were placed on the north slab. Some 2½ cu. yds. of reinforced concrete were placed in the south approach of this bridge.

At the guard-gate, the erection and riveting of the towers and gates were completed, except machinery. About 59 tons of metal were estimated. Some 15 cu. yds. of concrete were placed in the center counterweight.

Contract No. 19.— For prism excavation, rebuilding bridges, constructing masonry culvert, concrete-capped pile docking, etc., between Sulphur Springs guard-lock and mouth of Ellicott creek.

The total excavation for the month was 11,354 cu. yds. of which 11,182 cu. yds. were removed by the hydraulic dredge *Niagara* at Three-Mile bend and at Tonawanda. The dredge was laid up one week for repairs. The remaining 172 cu. yds. were excavated by

the clam-shell dredge *Teddy* at Tonawanda, which also placed 128 cu. yds. of embankment back of the concrete dock. The dipper-dredge *Buffalo* excavated about 20,000 cu. yds. at Tonawanda and west of Bush's bridge. This material will later be rehandled by the *Niagara*. The excavator *Lehigh* finished diking on the Miller property and later was moved to the Murray property and continued work there during the rest of the month. Work was continued on rebuilding the Martinsville dock. The pile-driver was employed. About 131 35-ft. piles, 34 20-ft. anchor piles and about 20,000 ft. B. M. of 6-in. sheeting were driven.

Champlain Canal.

Contract No. 70.— For dredging a channel in the Hudson river from outlet of Barge canal at Waterford to Lock No. 1.

Work continues suspended pending further action by the Canal Board.

Contract No. 71.— For constructing Lock No. 1 and Dam No. 1, above Waterford, and dredging Hudson river from Lock No. 1 to lower Mechanicville lock.

Work continues suspended pending further action by the Canal Board.

Contract No. 69.— For constructing Lock No. 2, at lower Mechanicville.

A McMyler crane began excavating in the tail-race from the wheel-pits, using a 1 cu. yd. clam-shell bucket. About 230 cu. yds. were excavated in the lock-chamber, completing the lower level. Excavation was also made for several port aprons and about 67 cu. yds. of concrete were placed in them. Excavation for conduit pipes was also completed. Work began on forms for south bridge abutment. Pull-boxes and wrought-iron pipe were placed in the upper conduit trench and placing pipe in the lower valve-well began. Riveting continued on the lower west leaf of gates, about 3,450 rivets being driven. Toe-posts are bolted in place on the upper gates and fenders have been placed. Steel pile cribs are being taken from piers in the tail-race of the Power Co.

Contract No. 72.— For dredging Hudson river from lower Mechanicville to Stillwater.

Work continues suspended pending further action by the Canal Board.

Contract No. 88.— For the construction of a steel highway bridge at Schuylerville, within the limits of Contract No. 73.

The ferry to maintain traffic is in operation. At the west pier piling is being driven for coffer-dam and to support water pipe which has heretofore rested on the bridge.

Contract No. 1.— For dredging Hudson river from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; constructing Crocker's Reef dam and approaches to "Land Line," etc.

Work closed down indefinitely.

Contract No. 24.— For constructing guard-gate at Crocker's Reef.

A guy-derrick, boiler and steam-drills were received on June 15 and set up. Work began on June 25 on rock ledge along the west side of prism, south of guard-gate site. Some 300 lin. ft. of holes were drilled and shot, loosening about 500 cu. yds. of ledge. A small amount was excavated and spoiled on river bank west of canal.

Contract No. 54.— For constructing Lock No. 7, at Fort Edward.

Excavation for the lock is practically completed, except about 1,000 cu. yds. between pile-heads at the south end of the lock and about 300 cu. yds. between pile-heads in the southwest approach wall. Some 3,000 cu. yds. of excavated material remains to be properly spoiled. The total excavation was 4,402 cu. yds. About 525 cu. yds. of embankment were formed, completing that back of the northwest approach wall and a portion of that along the back of the west side of the lock. About 4,736 lin. ft. of foundation piles were driven. The piling in the lock proper is completed and practically all that can be driven have been placed in the approach walls. The driving of wooden sheet-piling is completed.

About 1,765 cu. yds. of concrete were laid in the lock proper. This completes the footing courses, except two sections on the west and six on the east side; also one section of floor and one section of the east main wall. Some 1,643 cu. yds. of riprap were laid on the embankment of the northwest approach wall.

In steel erection, the upper gates were riveted and painted one field coat, two sections of quoin-plates and the pivot anchorage for the upper buffer-beam were set and the beam moved down in readiness to be placed.

Contract No. 27-A.— For completing the construction of the canal between the Hudson river at Fort Edward and the south end of Contract No. 25, at Dunhams Basin road.

South of Lock No. 8, on west side, 87 cu. yds. were grubbed. From spoil banks 9,075 cu. yds. were excavated, 7,860 cu. yds. being taken from the east side and the balance from the west side. All other excavation amounted to 7,045 cu. yds., of which 1,097 cu. yds. were from the west side and 143 cu. yds. from the east side of the wash wall notch north of East street; 651 cu. yds. were taken from the lower pool of Lock No. 8; 4,979 cu. yds. from prism at Argyle street and 175 cu. yds. from prism at lower end of contract. About 7,888 ft. B. M. of sheeting and bracing were used at the southwest approach wall of Lock No. 8 and 1,371 ft. B. M. in the lock proper. Embankment was formed to the extent of 1,794 cu. yds. on west side of prism north of East street and 325 cu. yds. on west approach to Argyle street bridge.

At Baldwin avenue bridge 7,820 ft. B. M. of yellow pine lumber were used. Some 39 20-ft. foundation piles were driven in the northwest approach wall of Lock No. 7 and 119 15-ft. piles at the southwest approach wall of Lock No. 8. About 28,440 ft. B. M. of sheet-piling were driven at Lock No. 7 and 3,096 ft. B. M. at the siphon spillway.

About 941 cu. yds. of second-class concrete were laid, of which 13 cu. yds. were in Lock No. 8, 93 cu. yds. in the power-plant and 835 cu. yds. in the southwest approach wall of the lock. Some 391 cu. yds. of reinforced concrete were also laid in bridge abutments, of which 307 cu. yds. were at Broadway and 84 cu. yds. at Argyle street. North of East street on the east side, 105 cu. yds. of wash wall were built. At the Broadway bridge 12,241 lbs. of reinforcement were used, and at Argyle street, 9,267 lbs. In the southwest approach wall of Lock No. 8, 143 lbs. of iron castings were placed.

A temporary road was built at Argyle street and the temporary roads and bridges at East street and Baldwin avenue were repaired.

Contract No. 25.— For prism excavation between a point 0.6 mile north of Comstock post-office and highway crossing at Dunhams Basin; constructing Lock No. 9, spillways, power-plant, etc.

About 9,945 cu. yds. were excavated, of which 300 cu. yds. were borrowed for embankment at Brayton's bridge, 1,852 cu. yds. for a like purpose at George Henry's bridge and the remainder was taken out by the dredge just north of Smiths Basin. About 895 cu. yds. of lining were placed, mostly at various bridges under paving and on approaches. Some 6,138 cu. yds. of wash wall were built, of which 179 cu. yds. were placed ½ mile south of Parish bridge, 518 cu. yds. just north of Smiths Basin bridge, 404 cu. yds. at southeast approach of Lock No. 9 and the remainder south of this lock. About 225 sq. yds. of paving were laid at Comstock bridge, 32 sq. yds. at Dewey's bridge, 386 sq. yds. at Fort Ann bridge and 106 sq. yds. at Smiths Basin bridge. Some 200 lin. ft. of wooden fence were built on approach at Comstock bridge and 579 lin. ft. at approach of Fort Ann bridge. In general work, stone for wash wall were transported, a derrick for ditch excavation erected at Fort Ann and temporary bridges at Brayton's and George Henry's removed.

Oswego Canal.

Contract No. 39.— For dredging channel in Oswego river, constructing stream entrances, excavating through Hinmansville cut-off, etc., between Three River Point and Fulton, except portion covered by Contract No. 53.

Dredging was continued, 19,033 cu. yds. of material being removed.

Contract No. 85.— For constructing a steel bridge over the lock at Phoenix.

Very little work was done during the month.

Contract No. 80.— For constructing a concrete dam across the Oswego river at Phoenix.

At the movable dam, 1,170 ft. B. M. of yellow pine were used, 42 cu. yds. of second-class concrete were placed in counterweights and adjusting blocks and 2,630 lbs. of reinforcing metal were employed.

Contract No. 104.— For the construction of a reinforced concrete arch bridge over the Barge canal at Broadway, Fulton.

Contract work not yet begun.

Contract No. 10-A.— For completing the construction of the canal, raising the upper dam, etc., from Broadway bridge, Fulton, south to Contract No. 39.

About 197 cu. yds. of material were removed by grubbing from the prism, at Yelverton island and on the old tow-path. About 12,663 cu. yds. were excavated, of which 1,290 cu. yds. came from prism, 9,357 cu. yds. from borrow-pit and the remainder from the face of the dike. Some 691 cu. yds. of overburden were also removed at the borrow-pit.

About 12,955 cu. yds. of embankment were formed, of which 3,988 yds. were on east side, and 8,967 cu. yds. on dike at Yelverton island. Some 14,236 ft. B. M. of sawed lumber were used as fenders. In the retaining wall back of upper east approach wall 177 cu. yds. of concrete were placed. About 50 cu. yds. of wash wall were built on the east side. Some 2,448 lbs. of castings were placed as snubbing posts and 1,488 lbs. of structural steel and 1,518 lbs. of 5/8-in. log chain were used on fenders. About 13 lin. ft. of 30-in. concrete drain were placed at the old guard-lock.

Contract No. 10-B.— For completing the construction of the canal from the upper end of Lock No. 2, Fulton, north to Contract No. 37.

Excavation and channeling continued at Lock No. 3, 3,700 cu. yds. being removed and 2,250 sq. ft. of rock surface being cut.

Contract No. 37.— For dredging a channel in Oswego river, constructing Locks Nos. 5 and 6, dams, bulkheads and other structures, and the removal of Battle Island and High dams, between Contract No. 10, at Fulton, and Contract No. 35, at Oswego.

Nearly 3 acres were cleared on the Bulger property. About 13,098 cu. yds. were excavated, of which 9,198 cu. yds. were removed between Contract No. 10 and Lock No. 5, 366 cu. yds. from Minetto wall and dike and extension, 2,817 cu. yds. from borrow-pit for wall and dike, and 717 cu. yds. from 18-in. tile drain. Some 2,888 cu. yds. of embankment were formed, of which 356 cu. yds. were at the drain and the remainder at the Minetto wall and dike. About 124 lin. ft. of vitrified pipe were laid in the drain and 11, 300 ft. B. M. of sheeting and bracing were required.

On road "B" adjacent, some 10,571 cu. yds. were excavated, mostly from borrow-pit, and 8,582 cu. yds. of embankment were formed.

Contract No. 35.— For prism excavation and constructing Locks Nos. 7 and 8, bulkheads, culverts, spillways, etc., between a point one-half mile above Utica street bridge and harbor line north of Bridge street, at Oswego.

About 3,647 cu. yds. of material were excavated, of which 2,473 cu. yds. were taken from prism, 384 cu. yds. from west wall, 455 cu. yds. from east upper approach of Lock No. 8 and 335 cu. yds. from east upper approach of Lock No. 7. Some 1,283 cu. yds. of concrete were laid, including 593 cu. yds. at east lower approach of Lock No. 7, 594 cu. yds. at east upper approach of Lock No. 8 and 96 cu. yds. at retaining wall west of Lock No. 7, About 122 lbs. of metal reinforcement and 777 lbs. of castings were used in each of the two approaches. Some 2,839 ft. B. M. of white oak lumber were used at the east wall and lower approach of Lock No. 7.

Cayuga and Seneca Canal.

Contract A.— For constructing Lock No. 1 and Dam No. 1, near Cayuga.

At Lock No. 1, 2,750 cu. yds. of concrete were placed in the east wall of the lock and 46 cu. yds. in the northeast approach wall. Excavating in the northeast approach wall continued, using the clam-shell bucket. About 1,400 cu. yds. of material were removed. Some 7,600 ft. B. M. of timber were used along this wall to brace the steel piling.

At the site of the dam, the coffer at the east end has been finished and pumped out. A trestle was built along the center line of the dam to carry the traveler for excavating and pile-driving. The river bottom is very soft and some trouble was experienced in holding the coffer-dam in place. In addition, 759 lbs. of structural steel, 1,258 lbs. of reinforcing metal, 140 lbs. of plain and 1,640 lbs. of machined castings and 951 lbs. of metal in buffer-beams were used.

Contract B.— For excavating a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from Cayuga lake to Seneca Falls and from Waterloo to deep water in Seneca lake.

The dredge *Clyde* continued working down the river, excavating 138, 130 cu. yds. of material and spoiling it east of the prism. A small force of men was employed in repairing dikes.

Contract H.— For excavating a channel in Cayuga lake inlet at Ithaca from a point about 300 feet north of Cascadilla street, to deep water in Cayuga lake.

Contract work not yet begun.

Water-Supply.

Contract No. 50.— For constructing dam, waste-gates and spillway across West Canada creek at Hinckley.

Excavation progressed for abutments at both ends of the dam, gate-chambers and ends of spillway section. A small amount was also excavated for core wall. The total excavation was 6,997 cu. yds. Some backfilling was done at the core wall and material excavated east of the south end of the dam was delivered along the upstream toe. About 8,681 cu. yds. of embankment were formed. About 164 cu. yds. of second-class concrete were placed in floor and wall of south gate-chamber. About 1,704 cu. yds. of third-class concrete were laid in 12 sections of the core wall. Some 480 cu. yds. of Cyplopean masonry were placed in the north and south abutments of the dam. About 1,062 cu. yds. of riprap and 408 cu. yds. of lining were placed on the upstream face of the embankment. Some 17,777 lbs. of 42-in. cast-iron pipe and specials were laid at the south gate-chamber. This work was completed and gates erected. Work progressed on cribs for a coffer-dam across West Canada creek and on the cableway to span the spillway section of the dam.

Contract No. 51.— For constructing a canal feeder from Trenton Falls on West Canada creek to Nine-Mile creek below South Trenton, with gate-house, culverts, highway, etc.

Browning shovel No. 1 awaited the arrival of engine and dump-cars until June 18, after which it began excavating in the feeder prism. Excavator " K " continued operating in deep cut in prism. Two traveling derricks were also in operation. A small amount of excavating was done at road culverts and for a drainage ditch. The total excavation was 12,666 cu. yds. About 241 cu. yds. of concrete were placed in road culvert.

Contract No. 55.— For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black River canal, with four locks and aqueduct over Mohawk river, highway change, bridges, etc.

Work has progressed in trimming slopes of the river bank above and below the dam at the east end, excavating the river channel, laying 24-in. stone paving and third-class riprap along west side of the river channel, grading the tow-path along the flight of locks, erecting fence and placing lining. A small amount of concrete was placed. The settlement in the paving on the canal embankment at the ravine has been filled with riprap. Quantities: Excavation, 5,824 cu. yds.; lining 88 cu. yds.; concrete, 37 cu. yds.; 24-in. stone paving, 84 sq. yds.; cobblestone paving, 34 sq. yds.; riprap, 335 cu. yds.; iron railing, 75 lin. ft.; wooden fence, 202 lin. ft.

The adjacent highways are complete and final estimates are being prepared.

Contract No. 55-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 55, Delta reservoir, to a new cemetery outside the flow lines.

The fence around the cemetery has been erected and markers are being set. Six hundred and ninety-four bodies have been reinterred to date.

Power-Supply.

Contract No. 91.— For building and equipping a hydro-electric power-plant on the Erie canal near the east end of Crescent dam.

The penstock is riveted and calked. About 33 cu. yds. of second-class concrete were placed in power-house partitions, etc., and 36 cu. yds. of first-class concrete in the floor. Forms are being built for walls of the superstructure.

Contract No. 90.— For constructing hydro-electric power-plants at Baldwinsville on the Erie canal, and at Smiths, Comstock and Whitehall on the Champlain canal. Also for constructing equipment for operating and lighting the following locks: No. 24, Erie canal; Nos. 1, 2, 7 and 8, Oswego canal; Nos. 9, 11 and 12, Champlain canal.

On the Erie canal:

At Lock No 24, preparing for final tests.

On the Champlain canal:

At Lock No. 9, equipment progressed. Wiring was placed from motors to cabinets and capstans, arc lights and power-house lighting system installed, governors erected and adjusted and interior of power-house painted, etc.

At Locks Nos. 11 and 12, final tests were run, the installation accepted and the locks are now being operated in connection with the Champlain division of the present canal system.

On the Oswego canal:

At Lock No. 7, 2,232 lbs. of metal duct and 1,540 lbs. of insulated conductor were laid.

At Lock No. 8, 519 lbs. of insulated conductor were laid.

Progress of Plans Being Prepared.

The following pages contain detailed accounts of the plans in process of preparation at the main and residency offices, showing progress up to the first of July. An order according to location is followed, as explained in the account of contract work for the month.

Erie Canal.

Contract No. 74.— For dredging Mohawk river from Hudson river to Contract No. 2-E. Plans 50 per cent completed.

Contract No. 18-A.— For completing the construction of the canal from Mindenville to Castle creek. Plans 83 per cent completed.

Contract No. 84.— For the construction of two steel lift-bridges at Clyde, within the limits of Contract No. 47. Work on plans suspended, pending an investigation as to elimination of grade crossing.

Contract No. 59.— For constructing a movable dam in the Genesee river at Rochester. Plans 90 per cent completed.

Contract No. 106.— For the construction of four lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Exchange street, Lockport; Middleport; Pros-

pect street, Medina; Main street, Brockport. Plans 96 per cent completed.

Contract No. 65.— For work from the west end of Contract No. 9, at a point near Beal's bridge, to the east end of Contract No. 64, at a point 600 feet west of Prospect street, Medina, including Oak Orchard creek crossing. Plans 75 per cent completed.

Oswego Canal.

Contract No. 37-R.— For the removal of bodies from the Minetto cemetery, within the limits of Contract No. 37, to a new cemetery outside the flow line. Plans 95 per cent completed.

Cayuga and Seneca Canal.

The contracts on this canal may be rearranged. For the present the old order is retained.

Contract C.— For constructing Lock No. 2 and Dam No. 2, near Demont's bridge. Plans under revision.

Contract D.— For constructing Lock No. 3 and excavating prism east of Seneca Falls. Plans under revision.

Contract E.— For constructing Lock No. 4 at Seneca Falls, three highway bridges, etc. Plans 70 per cent completed.

Contract G.— For dredging a channel in the Seneca river from Lock No. 4, at Seneca Falls, to Contract B, at Waterloo. Plans 50 per cent completed.

Contract F.— For constructing Lock No. 5 and dam at Waterloo. Plans 55 per cent completed.

Contract I.— For improving the canal from deep water in Seneca lake to Montour Falls, about 2.75 miles. Plans completed.

Contract J.— For improving Glen creek from the highway bridge in the village of Watkins to the canal improvement. Plans under way.

POWER-SUPPLY.

Contract No. 92.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 2, 3, 4, 5, 6 and 7, on the Erie canal, and Locks Nos. 6 and 8, on the Champlain canal. Plans 95 per cent completed.

Plans before Canal Board.

Contract No. 56.— Glens Falls feeder. Plans approved by Canal Board July 11, 1912.

Contracts Advertised.

Contract No. 101.— For the construction of a steel highway bridge superstructure at Three River Point. Advertised; bids opened July 30, 1912.

Contract No. 57.— For constructing the canal through Onondaga lake outlet. Plans approved by Canal Board, June 11, 1912. Advertised; bids opened July 30, 1912.

Contract No. 22-A.— For constructing a new substructure, approach spans and approaches for a bridge over the Erie canal at Weedsport. Advertised; bids opened July 30, 1912.

Contract No. 90-A.— For constructing hydro-electric power-plants, sub-stations and equipments to complete installations at Locks Nos. 1, 2, 7 and 8, Oswego canal. Advertised; bids opened July 30, 1912.

Bids Opened.

Contract No. 8-A.— For constructing Dam No. 4 and Lock No. 8 at Scotia and other incidental work pertaining to the completion of the locks at Rotterdam and Cranesville. Bids opened July 2, 1912. Five bids were received. The lowest of which was by The Foundation Company, of No. 115 Broadway, New York, N. Y., to whom it was subsequently awarded at $799,399.10. The detailed bids appear elsewhere.

Contract No. 103.— For the construction of a reinforced concrete arch bridge over part of the Oswego river at Phoenix. Bids opened July 2, 1912. No bids were received.

Recapitulation—Progress on Plans.

Contract No.	DESCRIPTION.	Canal.	Progress on plans.
8A	Supplemental to Contract 8	Erie	Awarded.
18A	Minoenville to Castle creek	Erie	83 per cent completed.
22A	Bridge approaches, etc., at Weedsport	Erie	Advertised.
37R	Removal of bodies at Minetto	Oswego	95 per cent completed.
56	GlensFalls Feeder	Champlain	Before Canal Board.
57	Onondaga lake outlet	Erie	Advertised.
59	Rochester harbor dam	Erie	90 per cent completed.
65	Canal and aqueduct at Medina	Erie	75 per cent completed.
74	Dredging Hudson river to Contract 2-E	Erie	50 per cent completed.
84	Two lift-bridges at Clyde	Erie	Suspended.
90A	Supplemental to Contract 90	Oswego	Advertised.
92	Power-house and lock equipments	Erie, Champlain	95 per cent completed.
101	Bridge at Three River Point	Erie	Advertised.
103	Bridge at Phoenix	Oswego	Bids opened July 2.
106	Bridges on Contracts 61, 64, 65 and 67	Erie	96 per cent completed.
C	Lock 2, near Demont's bridge	Cayuga and Seneca	Under revision.
D	Lock 3 and prism, east of Seneca Falls	Cayuga and Seneca	Under revision.
E	Lock 4 at Seneca Falls	Cayuga and Seneca	70 per cent completed.
F	Lock 5 and dam at Waterloo	Cayuga and Seneca	55 per cent completed.
G	Dredging, Seneca Falls to Waterloo	Cayuga and Seneca	50 per cent completed.
I	Watkins to Montour Falls	Cayuga and Seneca	Completed.
J	Glen creek at Watkins	Cayuga and Seneca	Under way.

Total Amount of All Kinds of Construction Work to June 1, 1912.

Similar kinds of work are grouped under one heading; an enumeration of the items grouped is shown in the foot-note.

Contract Number	Excavation.*a*	Embankment.*b*	Concrete.*c*	Rough stone work.*d*	Sawed lumber.*e*	Piling and round timber.*f*	Metal work.*g*	Metal work.*h*	Miscellaneous items of work.*i*	Miscellaneous construction items.*j*	Extra and unspecified work.*k*
	Cu. yds.	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*	*Ft. B. M.*	*Lin. ft.*	*Lbs.*				
1	705,669	24,657	4,608	13,589	85,724	65,613	308	0	$288	0	$7,834
2	426,125	58,420	82,910	0	26,440	22,350	375,792	$1,626	28,156	$3,368	35,942
2-E	112,094	53,267	21,507	4,725	118,340	58,121	46,138	1,922	703	18,218	6,755
3	829,101	117,298	34,262	29,212	54,715	300	184,513	0	6,338	1,195	54,839
4	2,844,909	113,441	10,974	56,042	1,150,717	576,255	214,346	495	35,622	1,968	12,584
4-B	361	361	92	34	1,893	0	818	49	0	111	0
5	901,601	10,649	1,770	518	56,457	497	0	0	2,862	153	0
5-A	0	0	0	0	0	0	0	0	0	0	0
6	2,100,989	35,038	4,135	10,256	0	0	0	0	700	27,267	766
7	0	0	111	10	139,617	0	1,859,128	0	1,000	4,611	3,244
8	243,303	38,458	64,916	13,568	439,660	367,481	2,054,061	74,167	702	13,447	356
9	552,370	365,318	9,881	63,610	106,760	2,434	1,745,044	5,908	12,836	9,586	3,594
10	331,845	26,335	49,490	4,933	94,428	0	403,227	7,987	2,377	16,848	2,019
10-A	12,289	5,218	173	606	5,350	0	2,820	0	270	0	0
10-B	1,500	270	0	0	0	0	0	0	0	125	0
11	674,949	305,392	148,671	2,245	256,526	6,285	864,881	0	1,336	9,315	2,398
12	4,822,468	50,506	18,895	650	64,090	2,246	638,796	0	8,347	1,359	329
13	0	0	0	2	8,760	0	432,756	0	0	2,872	0
14	621,660	162,116	200,649	36,760	739,343	49,354	5,881,316	6,926	70	5,947	32,154
14-R	0	0	0	0	0	0	0	0	0	475	0
15	2,726,267	102,392	56,648	34,325	304,962	101,988	1,427,601	54,664	42,600	6,536	8,965
16	0	0	0	2	71,704	0	1,069,538	267	0	18	0
17	146,747	23,139	48,593	23,017	222,870	1,768	2,900,379	129,799	200	1,365	1,835
18	456,609	222,540	25,845	2,144	139,205	5,244	83,828	30,327	3,367	2,959	19,606
19	2,825,303	26,508	13,352	1,455	1,097,119	22,255	329,434	0	3,433	459	4,883
20-A	281,046	3,045	0	590	0	0	0	0	0	0	200
20-B	455,823	0	0	13,819	0	0	0	0	74	2,435	0
20-C	832,677	0	0	741	0	0	0	0	144	1,991	0
20-D	177,632	0	28	0	0	0	0	0	58	0	0
21	1,189,767	0	986	25	450	0	3,863	0	3,245	8,287	0
22	15,324	11,531	686	142	0	2,057	108,548	0	1,350	1,995	0
23	1,613,962	662,923	54,542	1,825	33,081	1,313	939,885	676	5,947	2,975	601
24	3,546	431	0	1,080	0	0	0	0	0	0	0
25	4,934,127	103,137	26,848	53,432	1,227,022	56,316	148,456	654	1,750	1,598	1,325
26	94,456	0	0	0	0	0	0	0	10	0	0
27	926,187	30,514	18,866	0	84,819	6,760	82,820	35	1,239	40	14,885
27-A	137,658	46,508	6,661	6,629	105,552	15,390	193,797	484	845	240	454
29	800,630	230,907	22,285	1,246	613,400	8,265	478,586	0	5,715	2,782	5,535

30	2,772,795	165,542	24,073	9,377	19,596	1,115	300,785	6,000	8,880	1,063	0
31	210,460	8,428	53,380	14,174	73,898	2,753	1,626,052	738	8,870	4,427	1,468
32	0	0	1	0	59,944	0	39,980	0	0	0	0
33	0	0	46	0	112,827	0	2,344,206	50	0	0	1,739
34	0	0	195	3	0	0	377,532	632	0	3,260	59
35	130,656	3,142	46,715	5	37,136	0	795,497	9,435	436	2,398	911
36	0	0	0	0	0	0	0	46,860	0	0	410
37	555,254	1,978	190	0	27,400	0	606	0	678	1,482	0
38	12,835	0	315	846	1,986	0	111,433	0	200	1,308	348
39	221,735	0	0	0	0	0	0	0	0	0	0
40	1,947,774	7,410	5,563	36,139	29,092	378	611,703	600	15,370	39,706	95
41	909,620	647,096	204	546	0	0	0	0	1,250	404	97
42	1,912,474	277,371	3,619	242	521,421	31,636	528,646	0	873	2,443	0
43	743,003	0	3,274	0	124,066	12,347	539,513	327	3,836	0	0
44	1,721,583	77,037	30,569	117	1,267,732	40,688	380,001	73,937	14,945	14,449	0
45	258,373	34,021	30,781	3,277	110,908	1,272	779,368	2,760	38,205	5,098	867
46	3,820,985	2,180	3,131	1,004	174,155	20,388	1,402	64	7,725	0	0
47	3,159,734	16,427	18,039	11	55,053	5,755	439,801	0	17,180	8,934	0
48	916,695	90,676	11,368	1,174	1,930,900	8,404	18,255	26,012	2,870	50	2,889
49	992,332	6,055	17,462	11,646	1,510,000	10,140	643,676	0	10,131	858	0
50	56,645	63,587	18,952	0	212,742	0	208,761	0	2,798	0	0
51	195,624	5,041	786	387	4,620	340	3,500	0	1,017	300	0
53	56,689	10,145	15,333	68	18,455	586	339,154	0	3,260	827	1,113
54	19,759	8,326	7,782	406	242,939	48,220	12,054	47	11,116	0	0
55	341,262	116,108	98,150	1,409	79,433	1,200	879,182	13,470	8,825	10,655	1,111
55-R	0	0	0	0	0	0	0	0	0	6,102	0
60	1,161,676	776,530	17,205	81,059	125,399	5,405	1,550,127	3,878	35,035	20,420	26,841
61	781,845	483,415	11,270	37,608	55,164	2,070	738,096	1,215	27,400	4,508	102
62	1,164,267	406,744	40,592	24,235	61,200	1,566	3,060,871	2,932	52,070	13,252	1,715
63	1,494,777	270,731	69,142	24,713	301,667	7,173	3,024,529	3,186	33,490	30,673	183,866
64	578,833	341,188	19,115	27,007	59,264	2,300	2,127,225	1,750	29,275	11,505	108
66	622,458	257,303	16,316	50,576	77,351	3,522	1,119,952	21,733	23,486	9,165	4,386
67	197,390	19	18,073	30	81,875	303	2,645,204	4,768	14,085	14,953	8,573
68	555,036	61,762	61,804	5,821	100,155	2,984	1,352,317	0	27,100	6,129	1,645
69	61,254	0	17,939	0	10,481	423	463,776	0	6,625	1,787	0
70	237,321	0	0	0	0	0	0	0	1,300	0	0
71	383,617	0	10,916	0	0	0	48,379	0	5,782	300	4,345
72	498,830	0	0	0	0	0	0	0	360	0	0
73	957,471	10,234	2,022	0	8,618	68	2,325	0	3,015	174	0
75	0	0	82	0	0	0	601,094	0	0	0	0
76	1,092,309	111,719	17,361	0	418,000	0	247,040	0	8,433	54	1,650
77	1,373,726	50,886	31,860	0	657,152	8,805	771,621	2,625	13,410	1,159	521
78	105,700	93,877	41	5,501	0	0	696	0	0	1,827	51
79	858	0	969	0	0	0	406,488	0	2,600	1,917	681
80	4,926	0	5,939	0	6,170	0	502,567	10,250	22,600	0	209
82	0	0	0	0	7,876	0	347,471	859	0	3,181	0
85	761	171	145	43	3,560	0	98,030	2,370	240	0	0
86	738	455	0	0	12,039	50	2,068	0	525	0	0
89	0	0	0	0	0	0	0	0	0	0	0
90	136	102	424	0	0	0	398,771	122,073	407	16,989	22
91	1,497	27	630	0	0	0	17,511	3,956	975	0	0
104	0	0	0	0	0	0	0	0	200	0	0
105	0	0	0	0	0	0	0	0	0	0	0
Total	65,023,707	7,236,052	1,660,157	714,650	15,849,278	1,592,183	52,977,884	$178,453	$338,667	$392,302	$466,925

TOTAL AMOUNT OF ALL KINDS OF CONSTRUCTION WORK TO JUNE 1, 1912 — (*Continued*).

CONTRACT NUMBER	Excavation.*a*	Embankment.*b*	Concrete.*c*	Rough stone work.*d*	Sawed lumber.*e*	Piling and round timber.*f*	Metal work.*g*	Metal work.*h*	Miscellaneous items of work.*i*	Miscellaneous construction items *j*	Extra and unspecified work.*k*
	Cu. yds.	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*	*Ft. B. M.*	*Lin. ft.*	*Lbs.*				
A.....	39,543	0	7,543	0	163,249	89	24,480	36,386	1,572	4,825	0
B.....	2,668,207	0	0	0	0	0	0	0	205	0	0
H.....	0	0	0	0	0	0	0	0	0	0	0
Total.....	2,707,750	0	7,543	0	163,249	89	24,480	36,386	1,572	4,825	0
Grand total..	67,731,457	7,236,052	1,667,760	714,650	16,012,527	1,592,272	53,002,364	$714,839	$640,239	$397,127	$466,925

a Includes earth and rock excavation and grubbing. *b* Includes embankment and puddle. *c* Includes concrete (all classes) and grouted filling. *d* Includes ballast, dry retaining wall, wash-wall, lining, paving, riprap and stone filling in cribs. *e* Includes sawed lumber (all kinds), wooden sheet-piling and sheeting and bracing. *f* Includes foundation, mooring, test and fender piles, round timber in cribs and round timber bracing. *g* Includes chains, iron castings (plain or machined) iron pipe and specials, metal reinforcement, steel and iron fastenings, steel castings, structural steel and wrought iron. *h* Includes items usually paid for by the piece — fender fastenings, gate-hoists, lock-gates, needle-dams, traveling cranes, expanded metal, steel sheet-piling, electrical equipment, turbine machinery, lattice or wrought-iron pipe railings, iron fence, valve operating machinery, valves, valve-seats and valve-supports. *i* Includes bailing and draining, clearing, extra labor on forms and finishing concrete, removing concrete, dressing concrete, maintaining traffic, overhaul, removing revetment and removing existing structures. *j* Includes channeling, cut stone work, iron railings, paving (all kinds), raising bridge superstructures, repairs to local sewers, etc., sidewalks and curbs, trenching and backfilling, vitrified pipe, wooden fencing, drilling bolt holes and constructing office buildings. *k* Extra work orders.

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		S. PEARSON & SON, INC., 507 FIFTH AVE., NEW YORK, N. Y.		AMERICAN PIPE & CONSTRUCTION CO., 112 N. BROAD ST., PHILADELPHIA, PA.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.
Grading spoil banks and cleaning up	lump sum		$1,500 00	$1,500	$5,500 00	$5,500 00	$1,500 00	$1,500 00
Excavation	cu. yd.	56,800	60	34,080	1 50	85,200 00	60	34,080 00
Sheeting and bracing	M. ft. B. M.	310	55 00	17,050	64 30	1,933 00	55 00	17,050 00
Forming embankment	cu. yd.	31,500	18	5,670	30	9,450 00	21½	6,772 50
Lining	cu. yd.	440	1 50	660	1 50	660 00	1 50	660 00
Sawed lumber (yellow pine or Douglas fir)	M. ft. B. M.	1	55 00	55	66 80	66 80	66 00	66 00
Sawed lumber in coffer-dams	M. ft. B. M.	280	45 00	12,600	63 00	17,640 00	54 00	15,120 00
White oak lumber in miter-sills	M. ft. B. M.	1.4	150 00	210	180 00	252 00	150 00	210 00
Coffer-dam filling	cu. yd.	6,000	25	1,500	60	3,600 00	30	1,800 00
Foundation piles	lin. ft.	20,800	25	5,200	40	8,320 00	30	6,240 00
12-inch sheet-piling	M. ft. B. M.	48	70 00	3,360	77 00	3,696 00	84 00	4,032 00
Steel sheet-piling, 1st-quality	sq. ft.	31,400	1 25	39,250	1 50	47,100 00	1 50	47,100 00
Steel sheet-piling, 2d-quality	sq. ft.	27,400	25	6,850	50	13,700 00	30	8,220 00
2d-class concrete	cu. yd.	33,530	6 50	217,945	8 70	291,711 00	7 60	254,828 00
Concrete, pneumatic caisson work below El. 148	"	200	40 00	8,000	60 00	12,000 00	32 00	6,400 00
Concrete pneumatic caisson work, El. 148 to El. 209	"	15,100	25 00	377,500	38 70	584,370 00	20 00	302,000 00
Concrete in apron	"	4,050	15 00	60,750	20 00	81,000 00	18 00	72,900 00
Concrete in piers	"	2,330	10 00	23,300	9 20	21,436 00	10 00	23,300 00
2d-class stone paving	sq. yd.	2,500	2 00	5,000	2 20	5,500 00	2 40	6,000 00
1st-class riprap	cu. yd.	2,000	3 00	6,000	7 50	15,000	3 60	7,200 00
2d-class riprap	"	500	2 75	1,375	3 65	1,825 00	3 25	1,625 50
3d-class riprap	"	2,000	2 50	5,000	3 40	6,800 00	3 00	6,000 00
4th-class riprap	"	320	2 00	640	3 00	960 00	2 40	768 00
Structural steel	lb.	14,600	05½	803	.0635	883 30	05½	803 00
Embedded struct. steel, furnishing f. o. b. cars, Scotia	lb.	22,000	04½	990	.0495	1,089 00	04½	990 00
Embedded str. steel, hauling from cars, Scotia, and erecting	"	22,000	01	220	.011	242 00	01	220 00
Metal reinforcement	"	21,200	03½	742	.0385	816 20	03½	742 00
Steel castings	"	1,900	05	95	.055	104 50	05	95 00
Iron castings	"	10,800	03½	378	.0385	415 80	03½	378 00
Shoes and anchorages for uprights, furnishing f. o. b. cars, Scotia	No.	34	50 00	1,700	55 00	1,870 00	50 00	1,700 00
Shoes and anchorages for uprights, hauling from cars, Scotia, and setting	"	34	10 00	340	11 00	374 00	10 00	340 00
Metal for upper gates, furnishing f. o. b. cars, Scotia	"	2	2,380 00	4,760	2,618 00	5,236 00	2,380 00	4,760 00
Upper gates, hauling metal from cars, Scotia, furnishing all other materials and erecting complete	"	2	920 00	1,840	1,012 00	2,024 00	920 00	1,840 00
Metal for lower gates, furnishing f. o. b. cars, Scotia	"	2	3,470 00	6,940	3,817 00	7,634 00	3,470 00	6,940 00
Lower gates, hauling metal from cars, Scotia, furnishing all other materials and erecting complete	"	2	1,330 00	2,660	1,463 00	2,926 00	1,330 00	2,660 00

BIDS ON CONTRACT NO. 8-A — (*Continued*).

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		S. PEARSON & SON, INC., 507 FIFTH AVE., NEW YORK, N. Y.		AMERICAN PIPE & CONSTRUCTION CO., 112 N. BROAD ST., PHILADELPHIA, PA.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.
Metal for swing beams for needle-dams, furnishing f. o. b. cars, Scotia	No.	2	1,250 00	2,500	1,375 00	2,750 00	1,250 00	2,500 00
Swing beams for needle-dams, hauling metal from cars, Scotia, furnishing all other materials and erecting complete	"	2	350 00	700	385 00	770 00	350 00	700 00
Supports for valve seats, furnishing f. o. b. cars, Scotia	"	4	150 00	600	165 00	660 00	150 00	600 00
Supports for valve seats, hauling from cars, Scotia, and erecting	"	4	50 00	200	55 00	220 00	50 00	200 00
Lock valves, furnishing f. o. b. cars, Scotia	"	4	700 00	2,800	770 00	3,080 00	700 00	2,800 00
Lock valves, hauling from cars, Scotia and erecting	"	4	150 00	600	165 00	660 00	150 00	600 00
Removing concrete	cu. ft.	10,000	1 25	12,500	2 00	20,000 00	1 25	12,500 00
Pumping	mill. ft.-gal.	75,000	18	13,500	60	45,000 00	18	13,500 00
Totals				$888,363		$1,332,474 60		$878,739 50

ITEMS.	Measure.	Quantities.	A. McMULLEN, 149 BROADWAY, NEW YORK, N. Y.		THE FOUNDATION CO., 115 BROADWAY, NEW YORK, N. Y.		HOLBROOK, CABOT & ROLLINS, 331 MADISON AVE., NEW YORK, N. Y.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.
Grading spoil banks and cleaning up	lump sum		$1,500 00	$1,500 00	$1,800 00	$1,800 00	$1,500 00	$1,500 00
Excavation	cu. yd.	56,800	60	34,080 00	72	40,896 00	60	34,080 00
Sheeting and bracing	M. ft. B. M.	310	55 00	17,050 00	65 00	20,150 00	55 00	17,050 00
Forming embankment	cu. yd.	31,500	18	5,670 00	13½	4,252 50	18	5,670 00
Lining	"	440	1 50	660 00	1 50	660 00	1 50	660 00
Sawed lumber, yellow pine or Douglas fir	M. ft. B. M.	1	55 00	55 00	65 00	65 00	55 00	55 00
Sawed lumber in coffer-dams	"	280	45 00	12,600 00	50 00	14,000 00	45 00	12,600 00
White oak lumber in miter-sills	M. ft. B. M.	1.4	150 00	210 00	150 00	210 00	150 00	210 00
Coffer-dam filling	cu. yd.	6,000	25	1,500 00	25	1,500 00	25	1,500 00
Foundation piles	lin. ft.	20,800	25	5,200 00	20	4,160 00	25	5,200 00
12-inch sheet-piling	M. ft. B. M.	48	70 00	3,360 00	70 00	3,360 00	70 00	3,360 00
Steel sheet-piling, first-quality	sq. ft.	31,400	1 25	39,250 00	1 10	34,540 00	1 25	39,250 00
Steel sheet-piling, second-quality	"	27,400	25	6,850 00	30	8,220 00	25	6,850 00

Second-class concrete	cu. yd.	33,530	6 00	201,180 00	5 97	200,174 10	6 00	201,180 00
Concrete, pneumatic caisson work below El. 148	"	200	48 00	9,600 00	25 00	5,000 00	40 00	8,000 00
Concrete, pneumatic caisson work, El. 148 to El. 209	"	15,100	26 75	403,925 00	21 00	317,100 00	24 00	362,400 00
Concrete in apron	"	4,050	15 00	60,750 00	12 37	50,098 50	15 00	60,750 00
Concrete in piers	"	2,330	10 00	23,300 00	10 00	23,300 00	8 00	18,640 00
Second-class stone paving	sq. yd.	2,500	2 00	5,000 00	2 25	5,625 00	2 00	5,000 00
First-class riprap	cu. yd.	2,000	3 00	6,000 00	3 60	7,200 00	3 00	6,000 00
Second-class riprap	"	500	2 75	1,375 00	2 50	1,250 00	2 75	1,375 00
Third-class riprap	"	2,000	2 50	5,000 00	2 50	5,000 00	2 50	5,000 00
Fourth-class riprap	"	320	2 00	640 00	2 25	720 00	2 00	640 00
Structural steel	lb.	14,600	05½	803 00	05½	803 00	05½	803 00
Embedded structural steel, furnishing f. o. b. cars, Scotia	"	22,000	04½	990 00	04½	990 00	04½	990 00
Embedded structural steel, hauling from cars, Scotia, and erecting	"	22,000	01	220 00	01	220 00	01	220 00
Metal reinforcement	"	21,200	03½	742 00	03½	742 00	03½	742 00
Steel castings	"	1,900	05	95 00	05	95 00	05	95 00
Iron castings	"	10,800	03½	378 00	03½	378 00	03½	378 00
Shoes and anchorages for uprights, furnishing f. o. b. cars, Scotia	No.	34	50 00	1,700 00	50 00	1,700 00	50 00	1,700 00
Shoes and anchorages for uprights, hauling from cars, Scotia, and setting	"	34	10 00	340 00	10 00	340 00	10 00	340 00
Metal for upper gates, furnishing f. o. b. cars, Scotia	"	2	2,380 00	4,760 00	2,380 00	4,760 00	2,380 00	4,760 00
Upper gates, hauling metal from cars, Scotia, furnishing all other materials and erecting complete	"	2	920 00	1,840 00	920 00	1,840 00	920 00	1,840 00
Metal for lower gates, furnishing f. o. b. cars, Scotia	"	2	3,470 00	6,940 00	3,470 00	6,940 00	3,470 00	6,940 00
Lower gates, hauling metal from cars, Scotia, furnishing all other materials and erecting complete	"	2	1,330 00	2,660 00	1,330 00	2,660 00	1,330 00	2,660 00
Metal for swing beams for needle-dams, furnishing f. o. b. cars, Scotia	"	2	1,250 00	2,500 00	1,250 00	2,500 00	1,250 00	2,500 00
Swing beams for needle-dams, hauling metal from cars, Scotia, furnishing all other materials and erecting complete	"	2	350 00	700 00	350 00	700 00	350 00	700 00
Supports for valve seats, furnishing f. o. b. cars, Scotia	"	4	150 00	600 00	150 00	600 00	150 00	600 00
Supports for valve seats, hauling from cars, Scotia, and erecting	"	4	50 00	200 00	50 00	200 00	50 00	200 00
Lock valves, furnishing f. o. b. cars, Scotia	"	4	700 00	2,800 00	700 00	2,800 00	700 00	2,800 00
Lock valves, hauling from cars, Scotia, and erecting	"	4	150 00	600 00	150 00	600 00	150 00	600 00
Removing concrete	cu. ft.	10,000	1 25	12,500 00	1 00	10,000 00	50	5,000 00
Pumping	mill. ft.-gal.	75,000	18	13,500 00	15	11,250 00	20	15,000 00
Totals				$899,623		$799,399 10		$845,838 00

List of Barge Canal Contractors, with their Addresses.

Contract No.	NAME.	Address.
1....	Empire Engineering Corporation.....	6 Church street, New York, N. Y.
2-E..	Holler & Shepard.....	224 E. & B. building, Rochester, N. Y.
5-A..	James Stewart & Co.....	30 Church street, New York, N. Y.
8-A..	The Foundation Co.....	115 Broadway, New York, N. Y.
10-A..	T. A. Gillespie Co.....	50 Church st., New York, N.Y. (Newark, N.Y.)
10-B..	Oswego Construction Co., Inc.....	11 First street, Fulton, N. Y.
11....	Fort Orange Construction Co.....	112 State street, Albany, N. Y.
12....	James Stewart & Co.....	30 Church street, New York, N. Y.
13....	Penn Bridge Company.....	Beaver Falls, Pa.
14....	Acme Engineering & Contracting Co...	Mahion building, Herkimer, N. Y.
14-R..	Thomas F. Riley.....	42 Third street, Troy, N. Y.
16....	United Construction Co.....	467 Broadway, Albany, N. Y.
17....	Alexander Murdock.....	Fidelity building, Baltimore, Md.
19....	Great Lakes Construction Co.....	Chamber of Commerce building, Buffalo, N. Y.
20-A..	Houston Barnard.....	853 Powers building, Rochester, N. Y.
20-B..	S. Pearson & Son, Inc.....	507 Fifth avenue, New York, N. Y.
20-C..	American Pipe & Construction Co.....	112 North Broad street, Philadelphia, Pa.
20-D.	American Pipe & Construction Co.....	112 North Broad street, Philadelphia, Pa.
21....	Lane Bros. Co.....	Alta Vista, Va. (104 Cutler building, Rochester, N. Y.)
22....	M. Fitzgerald.....	Hoosick Falls, N. Y.
23....	Millard & Lupton Co.....	Allegany avenue and Tulip street, Phila., Pa.
24....	James D. Sherrill.....	Hudson Falls, N. Y.
25....	Atlantic, Gulf & Pacific Co.....	Park Row building, New York, N. Y.
27-A..	Holler & Shepard.....	224 E. & B. building, Rochester, N. Y.
29....	Maryland Dredging & Contracting Co.	Fidelity building, Baltimore, Md.
30....	Acme Engineering & Contracting Co...	Manion building, Herkimer, N. Y.
31....	Casey & Murray.....	320–321 Cutler building, Rochester, N. Y.
33....	Penn Bridge Company.....	Beaver Falls, Pa.
35....	Gilmour-Horton-Allen Co.....	Hudson Falls, N. Y.
36....	J. D. Miller.....	39 Cortlandt street, New York, N. Y.
37....	Henry P. Burgard.....	275 Lathrope street, Buffalo, N. Y.
39....	James Stewart & Co.....	30 Church street, New York, N. Y.
40....	United Engineering & Contracting Co..	17 West 42d street, New York, N. Y.
42....	Shanley-Morrissey, Inc.....	527 Fifth avenue, New York, N. Y. (65 South Main street, Mechanicville, N. Y.).
43....	M. A. Talbot Co.....	Stanwix Hall, Rome, N. Y.
44....	Scott Bros.....	Empire block, Rome, N. Y.
46....	Kinser Construction Co.....	Montezuma, N. Y.
47....	Crowell-Sherman-Stalter Co.....	Lyons, N. Y.
48....	Crowell-Sherman-Stalter Co.....	Lyons, N. Y.
49....	American Pipe & Construction Co.....	112 North Broad street, Philadelphia, Pa.
50....	Buffalo Dredging Co.....	1104 D. S. Morgan building, Buffalo, N. Y.
51....	Alto Construction Co.....	Holland Patent, N. Y.
54....	Hunkin-Conkey Construction Co.....	Cleveland, Ohio.
55....	Arthur McMullen.....	Singer building, New York, N. Y.
55-R..	Joseph Kalk & Alfred S. Brown.....	Taberg, N. Y.
60....	Empire Engineering Corporation.....	6 Church street, New York, N. Y.
61....	Cleveland & Sons Co.....	Brockport, N. Y.
62....	I. M. Ludington's Sons, Inc.....	128 Powers building, Rochester, N. Y.
63....	H. S. Kerbaugh, Inc.....	922 Arcade building, Philadelphia, Pa.
64....	Empire Engineering Corporation.....	6 Church street, New York, N. Y.
66....	Empire Engineering Corporation.....	6 Church street, New York, N. Y.
67....	Larkin & Sangster.....	Ashley building, Lockport, N. Y.
69....	I. A. Hodge & Co.....	504 Kirk building, Syracuse, N. Y.
70....	Shanley-Morrissey, Inc.....	527 Fifth avenue, New York, N. Y. (65 South Main street, Mechanicville, N. Y.).
71....	Shanley-Morrissey, Inc.....	527 Fifth avenue, New York, N. Y. (65 South Main street, Mechanicville, N. Y.).
72....	Shanley-Morrissey, Inc.....	527 Fifth avenue, New York, N. Y. (65 South Main street, Mechanicville, N. Y.).
75....	United Construction Co.....	467 Broadway, Albany, N. Y.
76....	T. A. Gillespie Co.....	50 Church street, New York, N. Y. (Newark, N. Y.).
77....	T. A. Gillespie Co.....	50 Church street, New York, N. Y. (Newark, N. Y.).
80....	Walter Bradley.....	Fulton, N. Y.
82....	Groton Bridge Co.....	Groton, N. Y.
85....	Lupfer & Remick.....	590 Ellicott square, Buffalo, N. Y.
86....	Lathrop, Shea & Henwood Co.....	324 Ellicott square, Buffalo, N. Y.
88....	Lathrop, Shea & Henwood Co.....	324 Ellicott square, Buffalo, N. Y.
89....	Owego Bridge Co.....	Owego, N. Y.
90....	D'Olier Engineering Co.....	Morris building, Philadelphia, Pa.
91....	The Hollington Co.....	Stoll building, Broadway and River street, Troy, N. Y.
104....	R. B. Murdock.....	142 Arcade street, Crown Point, N. Y.
105....	Skene & Richmond.....	Louisa, Ky.
A.....	Scott Bros.....	Empire block, Rome, N. Y.
B.....	Crowell-Sherman-Stalter Co.....	Lyons, N. Y.
H.....	James H. Dawes.....	112 North Broad street, Philadelphia, Pa.

SEP 25 1912

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AUGUST, 1912

Barge Canal Bulletin

Series V No. 8

DEPARTMENT OF

THE STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
ALEXANDER E. KASTL, Special Deputy State Engineer

ISSUED MONTHLY UNDER THE AUTHORITY OF THE STATE ENGINEER, BY THE BUREAU OF PUBLICATION AND REPORTS, DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR

CONTENTS

Progress of Contract Work..... 234
Brief Account of Contract Work for July..... 236
Progress of Plans Being Prepared..... 260
Plans before Canal Board..... 262
Contract Advertised..... 262
Award of Contracts..... 262
Bids for Contract No. 101..... 264
Bids for Contract No. 57..... 266
Bids for Contract No. 22-A..... 267
Bid for Contract No. 90-A..... 268

Progress of Contract Work.

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Aug. 1, 1912.
		Put under contract.*	Done to Aug. 1, 1912.	Done during July, 1912.	
1	Empire Engineering Corporation.....	$580,424	$474,400	0	81.8
2	Ferguson Contracting Company *a*....	990,076	694,390	0	70.1
2E	Holler & Shepard *b*.....	(307,023)	256,520	$2,120	83.6
3	Sundstrom & Stratton.....	657,273	633,290	0	Finished.
4	Empire Engineering Corporation.....	726,780	720,073	0	Finished.
4B	E. J. Doyle & Company.....	1,351	1,332	0	Finished.
5	Empire Engineering Corporation *a*...	156,941	125,820	0	80.2
5A	James Stewart & Company *b*.....	(317,597)	93,140	51,970	29.3
6	F. A. Maselli.....	1,026,550	1,033,864	0	Finished.
7	Groton Bridge Company.....	101,930	98,929	0	Finished.
8	Pittsburg-Eastern Company *a*.....	1,516,789	920,420	0	60.7
8A	The Foundation Company *b*.....	(799,399)	0	0	0
9	Thomas Crimmins Contracting Co....	803,297	655,461	0	Finished.
10	McDermott Contracting Company *a*.	1,111,965	*668,360	0	60.1
10A	The T. A. Gillespie Company *a*.....	(101,144)	55,860	5,290	55.2
10B	Oswego Construction Co., Inc. *b*.....	(491,295)	30,370	18,670	6.2
11	Fort Orange Construction Company..	1,333,199	1,177,160	7,340	88.3
12	James Stewart & Company.....	3,558,146	2,497,820	39,110	70.2
13	Pen Bridge Company.....	28,126	20,180	0	71.7
14	Acme Engr'g & Contracting Co.....	2,985,225	2,505,080	6,250	83.9
14R	Thomas F. Riley.....	724	470	0	65.0
15	Atlantic, Gulf & Pacific Company...	1,481,692	1,378,956	0	Finished.
16	United Construction Company.....	82,440	67,860	12,210	82.3
17	The Scofield Company *a*.....	842,418	57,560	0	Finished.
17	Alexander Murdoch *b*.....	(812,286)	743,760	150	Finished.
18	Kelley Bros. Contracting Company..	611,382	476,979	0	Finished.
19	Great Lakes Construction Company..	891,401	739,630	5,970	83.0
20A	Houston Barnard.....	490,837	270,230	12,600	55.1
20B	S. Pearson & Son, Inc.....	1,032,210	381,530	36,290	36.9
20C	American Pipe & Construction Co...	585,720	547,420	65,390	93.4
20D	American Pipe & Construction Co...	2,685,477	122,400	17,790	4.6
21	Lane Brothers Company.....	1,323,150	663,290	41,820	50.3
22	M. Fitzgerald.....	127,521	31,520	4,680	24.7
23	Millard & Lupton Company.....	1,808,797	958,580	36,910	53.0
24	Kingsbury Construction Company...	44,368	7,840	2,000	17.6
25	Atlantic, Gulf & Pacific Company...	1,707,192	1,499,970	19,590	87.9
26	Lake Erie Dredging Company.....	40,057	35,443	0	Finished.
27	Kinser Construction Company *a*.....	723,269	378,650	0	Finished.
27A	Holler & Shepard *b*.....	(449,192)	180,410	18,880	40.2
29	Maryland Dredging & Cont'g Co.....	691,250	420,930	5,340	60.9
30	Acme Engr'g & Contracting Co.....	2,605,475	1,344,260	70,330	51.6
31	Casey & Murray.....	831,302	728,760	6,220	87.6
32	Penn Bridge Company.....	46,797	44,375	0	Finished.
33	Penn Bridge Company.....	175,537	164,550	0	Finished.
34	M. Fitzgerald.....	22,449	22,258	0	Finished.
35	Gilmour-Horton-Allen Company.....	760,917	593,220	31,660	77.9
36	J. D. Miller.....	46,800	46,800	0	Finished.
37	Henry P. Burgard.....	2,462,609	1,029,840	35,260	42.0
38	Henry Tosh & Son.....	16,870	16,287	0	Finished.
39	James Stewart & Company.....	1,048,674	230,720	30,890	22.0
40	United Engr'g & Contracting Co.....	2,252,144	1,733,590	3,020	77.0
41	Butler Bros. Construction Company..	273,238	241,644	0	Finished.
42	Shanley-Morrissey, Inc.....	1,047,366	478,670	0	45.7
43	M. A. Talbot Company.....	1,413,016	244,000	34,160	17.3
44	Scott Brothers.....	1,751,479	833,560	38,950	47.5
45	Scott Brothers.....	472,802	418,652	0	Finished.
46	Kinser Construction Company.....	1,291,805	700,620	6,720	54.2
47	Crowell-Sherman-Stalter Company...	1,279,328	812,690	14,580	63.6
48	Crowell-Sherman-Stalter Company...	1,676,576	708,230	65,630	42.2
49	American Pipe & Construction Co...	735,227	507,410	19,490	69.0
50	Buffalo Dredging Company.....	971,769	196,790	16,800	20.2
51	Alto Construction Company.....	392,397	122,990	12,630	31.4
53	Scott Brothers.....	167,585	164,576	0	Finished.
54	Hunkin-Conkey Construction Co.....	250,590	144,760	27,000	57.8
55	Arthur McMullen.....	945,840	883,350	4,810	93.3
55R	Joseph Kalk & Alfred S. Brown.....	7,561	7,440	0	98.4
60	Empire Engineering Corporation.....	1,491,317	1,278,690	6,510	85.7
61	Cleveland & Sons Company.....	1,090,853	817,520	16,210	74.9
62	I. M. Ludington's Sons, Inc.....	2,515,043	1,533,480	75,920	60.0

Progress of Contract Work—(*Continued*).

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Aug. 1, 1912.
		Put under contract.*	Done to Aug. 1, 1912.	Done during July, 1912.	
63	H. S. Kerbaugh, Inc	$2,349,697	$1,383,840	$26,340	58.8
64	Empire Engineering Corporation	1,335,434	785,050	15,890	58.8
66	Empire Engineering Corporation	854,394	757,950	5,320	88.8
67	Larkin & Sangster	1,208,110	637,040	40,760	52.7
68	Shanley-Morrissey, Inc	1,024,282	946,168	0	Finished.
69	I. A. Hodge & Company	240,061	205,380	4,750	85.4
70	Shanley-Morrissey, Inc	779,636	236,240	0	30.3
71	Shanley-Morrissey, Inc	1,561,119	821,960	0	52.7
72	Shanley-Morrissey, Inc	1,221,112	618,900	0	52.3
73	E. M. Graves	518,829	517,223	0	Finished.
75	United Construction Company	42,917	40,950	4,170	95.4
76	The T. A. Gillespie Company	1,512,011	758,480	25,120	50.2
77	The T. A. Gillespie Company	1,701,808	1,062,490	69,720	62.4
78	Cunningham-Woodard Company	49,026	47,723	0	Finished.
79	Lupfer & Remick	37,480	33,980	0	Finished.
80	Walter Bradley	117,391	109,700	130	93.5
82	Groton Bridge Company	82,841	21,320	0	73.9
85	Lupfer & Remick	13,151	12,010	0	91.3
86	Lathrop, Shea & Henwood Co	43,440	4,940	0	11.3
88	Lathrop, Shea & Henwood Co	25,658	520	330	2.0
89	Owego Bridge Company	59,616	0	0	0
90	D'Olier Engineering Company	180,318	168,360	100	93.4
91	The Hollington Company	44,985	18,880	2,340	42.0
104	R. B. Murdock	39,370	340	140	0.9
105	Skene & Richmond	258,710	15,360	11,390	5.9
	Totals	$74,038,739	$46,880,433	$1,133,660	.....

Cayuga and Seneca Canal.†

A	Scott Brothers	$357,627	$172,870	$13,980	48.3
B	Crowell-Sherman-Stalter Company	1,436,597	637,880	48,350	44.4
H	James H. Dawes	205,649	0	0	0
	Totals	$1,999,873	$810,750	$62,330	.....

* Includes all alternations in force to date. *a* Suspended by order of the Canal Board. *b* Relet to complete former contracts, contract price not included in total. † Authorized by separate appropriation.

Brief Account of Contract Work for July.

The following pages show what has been done during the month on the several contracts now in force on the Barge canal. The Erie canal contracts are described in order from Waterford west to Buffalo, and the Champlain and Oswego canal contracts follow, in order from south to north, while the Cayuga and Seneca canal contracts are given from east to west.

Erie Canal.

Contract No. 33.— Lock-gates and valves, guard-gates, etc., on Contracts Nos. 2, 10, 11 and 15.

Final estimates were approved by the Canal Board July 11, 1912,

Contract No. 16.— For eleven steel highway bridges, ten of which are at various points on Contracts Nos. 25 and 27, Champlain canal, and the remaining one on Contract No. 11, Erie canal.

On Contract No. 27-A:

The Argyle street bridge was erected and painted.

At Broadway the bridge floor and sidewalk are nearly laid. Steel has been delivered for the east girder span. The main span is erected and about one-third riveted.

On Contract No. 25:

At George Henry's bridge, painting steel work.

Contract No. 13.— For three bridge superstructures on Contract No. 12 and two on Contract No. 18.

No contract work was done.

Contract No. 2-E.— For completing the construction of the canal from the Mohawk river at Waterford to a point about one-fourth mile above the head of Lock No. 3.

Excavation below Lock No. 2 was completed, 1,806 cu. yds. being removed. About 124 cu. yds. were excavated for guide-piers above Lock No. 3. About 600 cu. yds. of embankment were formed behind the south approach to Lock No. 2. Some 94 lin. ft. of fenders were also placed.

In the north crib approach to Lock No. 2, 11,500 ft. B. M. of yellow pine facing timber, 970 lin. ft. of round timber and 207 cu. yds. of stone filling were placed.

Contract No. 11.— For prism excavation and construction from Contract No. 2 to Mohawk river below Crescent, including Locks Nos. 4, 5 and 6, highway, bridge abutments, guard-gate, masonry, etc.

About 892 cu. yds. of second-class concrete were placed, of which 156 cu. yds. completed the core wall on south side of Lock No. 4; 45 cu. yds. in docking between Locks Nos. 5 and 6; 550 cu. yds. in piers on south side between Locks Nos. 4 and 5 and 141 cu. yds. in south retaining wall above Lock No. 6.

A Page bucket was placed in operation July 25, in borrow-pit below Lock No. 4, excavating about 400 cu. yds., which was placed in embankment on both sides of the core wall. Excavation for piers on south side between Locks Nos. 4 and 5 was completed. The Bucyrus shovel removed about 730 cu. yds. from prism between Locks Nos. 5 and 6. The Vulcan shovel, on double shifts, removed about 4,000 cu. yds. of material from the rock cut, which was placed as embankment behind the south retaining wall in rock cut and in spoil at Mohawk river. About 666 sq. ft. were channeled and drilling completed in rock cut. On the south side, the bank was stripped to rock surface.

Contract No. 14.— For work from Contract No. 11 to a point near Rexford Flats aqueduct, including Lock No. 7 and Dams Nos. 2 and 3; also for contructing Locks Nos. 13, 14 and 15, Dams Nos. 9, 10 and 11, Mindenville retaining dam, etc.

At Dam No. 2, Lock No. 7, Vischer's Ferry, the scraper tower and traveler removed about 980 cu. yds. from prism. About 1,060 cu. yds. were excavated in foundation for Dam " E," on the island.

About 2,000 cu. yds. of embankment were formed, 830 cu. yds. of which were at Lock No. 7 and upper approach walls, 1,170 cu. yds. being placed at the core wall of the lock. About 160 cu. yds. of wash wall were also laid at the core wall.

In concrete, 16 cu. yds. of first-class were placed between Dams " D " and " E " and 421 cu. yds. in Dam " E." For flashboard sockets in Dam " E," 1,488 lbs. of structural steel and 177 lbs. of iron castings were placed.

At Dunsbach Ferry dam the north section of the Watervliet Hydraulic Co.'s dam was blown out on July 22 and drilling on the south section began.

At Head-gates of Dam No. 3 a shelter for gate-tenders and a railing along the old canal were erected.

At Dam No. 9, Lock No. 13, Yosts, plant was repaired and shipped away. The dredge was passed through the lock and towed to Canajoharie. The railing on the bridge stairs was finished and bent steel replaced. Riprap along the upper guide wall was brought to grade.

At Dam No. 10, Lock No. 14, Canajoharie, grading about the lock was completed and all paving laid.

Contract No. 14-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 14 to new burial plots outside the flow lines.

At Crescent, cement posts were delivered and the work of setting them began July 30.

Contract No. 20-D.— For dredging Mohawk river channel, constructing stream entrances, etc., between deep water below Rexford Flats aqueduct and center of bridge at Dam No. 9, at Yosts.

The hydraulic dredge excavated 13,155 cu. yds. of material, which was placed on Gardinier island and the north side of the river. The dipper-dredge excavated 18,839 cu. yds., which was spoiled in the back channel.

At Tribes Hill, about 1,164 cu. yds. of blasted rock and gravel were removed from the prism and about 16 cu. yds. of concrete dike were built.

At Danoscara creek, about 949 cu. yds. were excavated, 19 sq. yds. of paving laid and 126 cu. yds. of riprap placed.

Below Yosts dam and also below Cranesville the building of dikes progressed.

Contract No. 8-A.— For constructing Dam No. 4 and Lock No. 8 at Scotia and other incidental work pertaining to the completion of the locks at Rotterdam and Cranesville.

Contract recently awarded to The Foundation Company.

At Dam No. 4, Lock No. 8, Scotia, work began July 22, erecting office and other general work.

Contract No. 17.— For constructing Dam No. 7 and Lock No. 11, at Amsterdam, and Dam No. 8 and Lock No. 12, at Tribes Hill.

At Dam No. 8 work continued in scraping gravel from the sill. Ten pairs of uprights were properly seated.

Contract No. 20-C.— For dredging Mohawk river channel, constructing stream entrances, etc., between center of bridge at Dam No. 9, at Yosts, and center of bridge at Dam No. 10, at Canajoharie.

The dipper-dredge continued excavating, between Canajoharie creek and the end of the contract. About 16,862 cu. yds. of material were placed on scows, which dumped it in deep water between Spraker's and Canajoharie. The dredge also removed about 11,692 cu. yds. of material washed down from above the dam since the work stopped last December.

The hydraulic dredge placed 95,896 cu. yds. in spoil north of the Erie canal and east of Yatesville aqueduct. This amount was from prism, except 7,956 cu. yds. from Yatesville creek. About 147 cu. yds. were removed from Canajoharie creek, 38 cu. yds. from Flat creek and 247 cu. yds. from another stream entrance, the excavation being by hand labor, derricks and skips.

At Canajoharie creek, 84 cu. yds. of fourth-class, 69 cu. yds. of second-class, and 37 cu. yds. of first-class riprap, and 243 sq. yds. of stone paving were laid. A large dump-scow is nearly completed.

Quantities: Excavation, 124,883 cu. yds.

Contract No. 86.— For the construction of one span of a highway bridge over the Mohawk river at Canajoharie, to replace two existing spans, which will be removed.

Very little work was done during the month. Bents for the second span were framed, tie-rods for forms cut off, etc. On July 26 the erection of a temporary bridge began.

Contract No. 20-B.— For dredging Mohawk river channel, constructing stream entrances, etc., between the center of bridge at Dam No. 10, at Canajoharie, and the upper miter wall of the new lock at Mindenville.

The two dipper-dredges and the hydraulic disposal boat continued prism excavation, removing about 40,320 cu. yds. to spoil on north side, east of St. Johnsville bridge. One dipper-dredge for a part of the month cast over to spoil on north side about 10,000 cu. yds. The orange-peel dredge deposited about 787 cu. yds. of cobblestone for shore protection. The rock-breaker began work July 18 and has broken about 175 cu. yds. The 10-ton crane leveled spoil cast up by the dipper-dredge.

About 1,500 cu. yds. were excavated at Otsquaga creek. A 10-in. centrifugal pump was installed here.

Quantities: Excavation, 54,407 cu. yds.

Contract No. 20-A.— For dredging Mohawk river channel, etc., between Castle creek and upper miter wall of lock at Little Falls.

The orange-peel bucket machine continued operating in vicinity of Castle creek, depositing material in north embankment and spoil in rear. Excavating on south side for wash wall progressed. The dredge *Indian Castle* continued excavating in river, depositing material on Garlock property. Some material too hard to pump was encountered.

About 1,000 cu. yds. of embankment were formed on the north side of Castle creek. Wash wall was also laid on south side, using cobblestones and also syenite rock brought from Little Falls.

Quantities: Excavation, 12,172 cu. yds.; wash wall, 1,117 cu. yds.

Contract No. 31.— For improving the Erie canal at Little Falls, constructing Lock No. 17, and modifying the dam and constructing guard-gates at Rocky Rift.

Prism excavation near William street was completed. Excavation for dry wall along Southern avenue was finished. At Rocky Rift dam, excavation for concrete at the upstream face was completed and 55 cu. yds. of old masonry removed from the west end. About 305 cu. yds. of lining were placed on the bottom of the canal over riprap in rear of tow-path. Some 178 cu. yds. of second-class concrete were placed, completing the dam.

The west wing of the dry wall at the rear of retaining wall at the Adirondack Mill and the wall on south side along Southern avenue were completed. Concrete copings were placed on these and the wall in front of the retaining wall. The dry walls on the contract are completed. Some 25 sq. yds. of stone paving were laid under the south slab of Hansen avenue bridge, completing it.

The old stone removed from Rocky Rift dam were placed as riprap at the downstream face, to the extent of 55 cu. yds. About 315 cu. yds. of riprap were also placed to grade on roadway at the N. U. guide wall and retaining wall No. 1. At Rocky Rift dam, 32 additional steel bents were placed, using 10,408 lbs. of metal. The dowels and required reinforcement employed 2,505 lbs. of metal. Along Southern avenue, 100 lin. ft. of pipe-railing were placed.

The concrete repairs on the lock, and retaining walls Nos. 1 and 2 were practically finished. The roadway was trimmed, ready for lining. The Perry house, near the lock, is being removed.

Quantities: Excavation, 2,098 cu. yds.; dry wall, 271 cu. yds.

Contract No. 30.— For dredging channel in Mohawk river and land line from Little Falls to Sterling creek, constructing Lock No. 18 at Jacksonburg, Dam No. 14 and guard-gates at Herkimer, retaining dam at Frankfort, bridges, etc.

Above Little Falls, the coffer-dam was completed, unwatered, and drilling began. On July 22 the eastern coffer-dam failed and the site was flooded. Repairs were made and drilling resumed July 30. The Marion shovel was removed to this location. The dikes were completed on the Jacob Sharpe property and the shovel is being removed to Fort Herkimer. The 16-in. dredge *General Herkimer* was employed in banking the coffer-dam until July 10, after which it was on regular excavation, removing 35,922 cu. yds. of material, which was spoiled south of the river and next to the Erie canal.

At Lock No. 18, buffer-beams and valves are in place and painted. White oak and sawed lumber has all been placed on the gates. The lock chamber has been stripped to rock surface. Electric conduits were placed and connections made. The placing of snubbing-posts behind the south wall began. Pumping at the lock was discontinued July 25.

From Lock No. 18 to Fort Herkimer, tower scraper No. 5 grubbed area for north embankment and made prism excavation. The grubbing required was very heavy. Traveling derrick No. 414 continued forming south embankment, using material borrowed last season. Culvert No. 75, Erie canal, was plugged and water diverted through ditch behind south embankment. Lining was placed on the tow-path.

At Fort Herkimer, excavating was done for wash wall on north side, but material is not yet removed to place. Work progressed on trackage, etc., for spoil near Spoon creek.

At the guard-gate, Herkimer, a small Thew shovel excavated material which was spoiled to the west. A guy-derrick was erected at the north abutment of the highway bridge. The U. & M. V. railway detour was completed.

At Dam No. 14, Herkimer, excavation has progressed for apron of dam, south abutment and riprap protection. About 144 sq. ft.

of steel sheet-piling were driven at the dam and south abutment. Concrete was placed in the cut-off wall under the dam. Riprap protection was placed below the south abutment.

At Ilion, the dredge *DeWitt Clinton,* on triple shifts, excavated 99,437 cu. yds. from prism to spoil south of the river. Dikes were completed on Farrington, Morgan and Chismore properties. The highway bridge was moved about 65 feet to the south, the dredge passed through and a temporary bridge constructed to the old abutment.

At Frankfort a derrick was erected and concrete material delivered for bridge abutment. At East Schuyler sheeting was driven and some excavation made for south abutment. Piling was delivered.

About 2½ miles west of Frankfort piles were driven and other work done to close the old river channel. The derrick sloper continued operating on the north bank of the canal.

Quantities: Excavation, 144,969 cu. yds.; embankment, 4,133 cu. yds.; concrete, 287 cu. yds.

Contract No. 29.— For excavating prism from Sterling creek to Oneida-Herkimer county line, constructing lock at Sterling creek, bridges, etc.

Some 150 cu. yds. of material were excavated from Sterling creek inlet channel and dam. To this may be added 2,722 cu. yds. of material excavated but retained from previous months. About 947 cu. yds. of embankment were allowed. About 13,100 ft. B. M. of new sheeting and bracing were used at culverts. Some 11,047 ft. B. M. of wooden sheet-piling were driven, of which 4,215 ft. B. M. were on north side at Morrison swamp; 1,776 ft. B. M. at Knapp brook and 1,920 ft. B. M. at Wood creek stream entrances; 1,752 ft. B. M. at Burch creek and the remainder in ditches. About 696 sq. ft. of steel sheet-piling were also driven at Sterling creek dam.

About 232 cu. yds. of concrete were laid, of which 69 cu. yds. were in lock walls, 122 cu. yds. at Sterling creek dam and the remainder at dive culvert. Some 941 lbs. of reinforcing metal were used at the lock and culvert.

Work began on Day's culvert. A good start was made on Sterling creek dam. Operations are centering around the forebay of Lock No. 19. Some trimming of banks was done and the north wall of the lock partly backfilled.

Contract No. 42.— For prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillway, stream entrances, culverts, etc.

Contract canceled by order of the Canal Board on July 18, 1912.

Contract No. 43.— For constructing the canal from a point just south of Oriskany road to about 1,500 feet west of Mud creek.

The dredge *Stanwix* removed 145,696 cu. yds. and the Lidgerwood cableway 39,392 cu. yds. from the prism. About 140 cu. yds. of concrete were laid at Nine-Mile creek spillway.

Contract No. 44.— For constructing the canal from about 1,500 feet west of Mud creek, west of Rome, to about three miles west of New London, including junction lock, Locks Nos. 21 and 22, bridges, culverts, spillways, stream entrances, etc.

About 77,857 cu. yds. were excavated, of which 64,940 cu. yds. were from prism, 6,032 cu. yds. by derricks and teams at Lock No. 21 and approaches, 6,501 cu. yds. by tower scraper No. 1 at Lock No. 22 and the remainder by teams and scrapers at spillway and south ditch.

At Lock No. 21, 44,556 ft. B. M. of sheeting and bracing were reused and 192 sq. ft. of steel piling were driven at lower south approach walls; 995 lin. ft. of foundation piles were driven; 22,296 ft. B. M. of wooden sheet-piling were used; 1,599 cu. yds. of concrete laid; 236 lbs. of structural steel and 466 lbs. of metal reinforcement were used; 242 lbs. of metal were also used in lock-gates.

At Lock No. 22, 1,148 cu. yds. of concrete were laid; 239 lbs. of structural steel, 3,224 lbs. of metal reinforcement and 6,973 lbs. of castings were used.

Contract No. 12.— For excavating prism between Oneida lake and Mosquito Point bridge on Seneca river; constructing Lock No. 23 and other structures.

On the eastern part of the contract, hydraulic dredge No. 1 worked for a week and then moved to the western section. Ladder-dredge No. 2, working in the Brewerton cut, removed about 12,500 cu. yds. of material. Dipper-dredge No. 7 removed about 47,000 cu. yds.

At Lock No. 23, concrete work progressed as rapidly as the building of forms would permit, about 2,000 cu. yds. being laid.

Embankment was built on the north side of the prism, above the lock.

On the western part of the contract, dredge No. 5 worked along the north bottom angle, dumping material into prism on Contract No. 5-A, to be later removed by the hydraulic dredge.

Drill-boat No. 2 was moved to Hickory island to drill hard material in that vicinity.

Quantities: Excavation, 94,426 cu. yds.; embankment, 6,565 cu. yds.; concrete, 2,325 cu. yds.; reinforcing metal, 1,126 lbs.; structural steel, 380 lbs.; metal in lock-gates, 840 lbs.

Contract No. 22.— Bridges on Contract No. 12.

Work progressed at Free, Bonta's, Jordan and State Ditch bridges. About 535 cu. yds. of concrete were placed at the three first named, with 185 lbs. of reinforcing metal. About 35 cu. yds. were excavated at State Ditch bridge, and 986 lin. ft. of foundation piles, 17 to 20 feet long, were driven at Free bridge.

Contract No. 46.— For the construction of the canal from Fox Ridge to the southeast corner of the town of Galen, including Lock No. 25, a movable dam at May's Point, bridges, etc.

The north abutment of the movable dam at May's Point was completed. At County Line bridge concrete footings for back-posts were placed and work on west abutment progressed. About 1,300 cu. yds. of fill were placed in the east approach.

At Lock No. 25, driving steel sheet-piling, pumping out the pit and raising the coffer-dam is in progress.

Quantities: Excavation, 2,868 cu. yds.; embankment, 1,370 cu. yds.; concrete, 189 cu. yds.; steel sheet-piling driven, 3,510 sq. ft.

Contract No. 47.— For the construction of the canal from the southeast corner of the town of Galen to a point near the N. Y. C. & H. R. railway crossing at Lyons, including Lock No. 26, a dam across the Clyde river, highway bridge, stream entrance, etc.

Work was confined to the dam at Lock No. 26 and vicinity. Some material was excavated from the site and deposited in a temporary bank in the river. About 2,204 cu. yds. of concrete were placed in the dam and 36 cu. yds. in setting snubbing-posts. About 200 cu. yds. of embankment were formed at the upper approach of the lock.

Contract No. 5-A.— For the completion of Contract No. 5, from Mosquito Point to Campbell's bridge, including construction of Owasco creek entrance, reconstruction of bridge at Mosquito Point and new pier and approaches at Howland island bridge, etc.

Dredge No. 5 continued work near Mosquito Point bridge and later moved up near Howland island bridge, where it is now working in hard material. Another derrick, to handle riprap stone, was erected at Mosquito Point bridge. Hydraulic dredge No. 1 was transferred to this contract and began operations July 13, working eastward. The dredge is excavating below grade, to provide spoil area for the output of dipper-dredge No. 5. Excavation for riprap in front of south abutment of Mosquito Point bridge is about half completed and about 20 per cent of the riprap was placed. The pit for the new north abutment is partly excavated.

Quantities: Excavation, 31,599 cu. yds.; riprap, 69 cu. yds.; steel sheet-piling driven, 729 sq. ft.

Contract No. 89.— For the construction of five superstructures and one substructure for highway bridges between Lyons and Palmyra on Contracts Nos. 48, 76 and 77.

Contract work has not yet begun.

Contract No. 48.— For the construction of the canal from a point near the N. Y. C. & H. R. railway crossing at Lyons to a point near the West Shore railway crossing at East Newark, including Locks Nos. 27 and 28-A, dam and power-house, retention dam across Canandaigua outlet, spillway, culverts, highway, bridge, approaches, etc.

The total excavation was 85,461 cu. yds., of which the dredge *Lyons* removed 53,000 cu. yds. west of Geneva street, the Marion shovel removed 11,100 cu. yds. at the blue cut, the Browning crane removed 10,600 cu. yds. west of the N. Y. C. railway bridge, the remainder being from the locks and ditches. The dipper-dredge was used to loosen material in prism.

About 1,760 lin. ft. of foundation piles and 80 cu. yds. of second-class concrete were placed in the lower approach of Lock No. 27. About 55,000 ft. B. M. of sheeting were driven on the Hills parcel. Some 2,292 cu. yds. of concrete were placed at Lock No. 28-A. The paving at inlet and outlet of the blue cut culvert was completed and 544 cu. yds. of wash wall built.

Steel has arrived for Geneva street bridge and false work is being erected.

Contract No. 76.— For the construction of the canal from a point near the West Shore railway crossing at East Newark to a point about one-half mile east of Port Gibson.

At Lock No. 28-B, the steelwork was practically completed. Work on the Newark dock was interrupted to some extent by an accident to the locomotive crane. Some 2,550 cu. yds. of concrete were placed in the dock previous to the accident.

Work on the spillway began. Material was excavated but not placed in spoil and will be rehandled later.

A 12-in. pump was installed for draining cellars in West Union street.

On the highway changes adjacent:

On Peek's highway, 249 cu. yds. of lining were placed.

On Port Gibson highway, 2,168 cu. yds. of lining and 17 cu. yds. of concrete were placed.

Contract No. 77.— For constructing the canal from one-half mile east of Port Gibson to one-half mile west of Palmyra, including Lock No. 29, power-plant, bridges, culverts, etc.

At Port Gibson bridge, work on abutment continued. About 451 cu. yds. of second-class concrete were laid.

The dredge *Palmyra* removed 64,180 cu. yds. of material from the prism at the big cut.

At Galloway's bridge the reinforced concrete slab and columns and the culvert under the approach were built. About 125 cu. yds. of reinforced concrete were required for the slab and 32 cu. yds. for the culvert.

At Lock No. 29 and vicinity, concreting continued. About 1,294 cu. yds. were placed in the lower approach walls and 1,262 cu. yds. in the lock proper. About 7,360 cu. yds. of material were excavated for the lower approach and power-house.

Steam shovel No. 20 removed 27,615 cu. yds. of material from prism.

Upon that portion of the Port Gibson highway adjacent to the contract, 970 cu. yds. of lining were placed.

Contract No. 49.— For prism construction from a point about 500 ft. east of Yellow Mills bridge, about one mile west of Palmyra, to the Monroe county line, including Lock No. 30, sluice-gates, highway bridges, culverts, etc.

At Lock No. 30, 2,729 cu. yds. of second-class concrete were placed in Lock No. 30 during the month. Some 3,395 cu. yds. of material were excavated from borrow-pit at Frear's bridge and formed 3,016 cu. yds. of embankment in south approach. The bridge superstructure was painted.

The superstructure of Wayneport bridge was also painted and wooden paving was placed at both bridges.

Contract No. 63.— For enlarging present canal and constructing culverts, sluiceways, waste-weir, guard-gates, dock walls, bridges, highway changes, etc., between Wayne-Monroe county line and Kings Bend.

The hydraulic dredge *Fairport* continued prism excavation, pumping material to adjacent spoil area. The Lidgerwood excavator worked westerly to Cobb's bridge, excavating the north slope of the prism and casting the material into adjacent embankment and spoil. Other excavation, by hand labor and teams, was in trimming slopes of Thomas creek ditch and of south slope of prism, material from the latter being placed in the south approach of Parker street bridge. Some lining was placed on the tow-path and on approaches to State street bridge. Considerable coping stone was placed on wash walls. The fourth-class riprap lining on the south slope of the new Cartersville bank is completed. The north approach of Cartersville bridge is completed and the approaches of Monroe avenue and Main street bridges are being filled. The concrete slab for Cartersville bridge and the north piers for Monroe avenue bridge were placed.

Quantities: Excavation, 49,745 cu. yds.; embankment, 2,861 cu. yds.; concrete, 128 cu. yds.; lining, 863 cu. yds.; wash wall, 37 cu. yds.; riprap, 2,700 cu. yds.

Contract No. 23.— For prism excavation between Kings Bend and Genesee river, and construction of Locks Nos. 32 and 33, guard-lock, bridges, culverts, etc.

Pumping was maintained continuously at Lock No. 33 and at Lock No. 32 for about half of the month.

Steam-shovel No. 2449 excavated in prism between East and West Henrietta roads, cutting to final grade along north toe of slope. Shovel No. 1178 excavated the old slope to a series of bermes, the top berme being about 15 feet wide and about 48 feet above grade of prism. Material from these shovels was placed

partly in the north approach of South avenue bridge and partly in adjacent north embankment, being compacted by the use of a 2-in. stream of water from a hose, instead of rolling.

Shovel No. 667 continued excavating in prism east of Lock No. 33, cutting to a little below grade and disposing of material on north side of Lock No. 33, in embankment and spoil, and in south embankment just west of the upper spillway. This was also compacted by the use of water.

Other excavation, by hand or by teams and scrapers, was made at the lower guide wall of Lock No. 32, at by-pass channel, for riprap in forebay of Lock No. 33, for wash wall east of Clover street, at drainage ditch on south side east of Edgewood avenue, and for north retaining wall at East Henrietta road bridge.

Foundation piles were driven for wall in front of north abutment of West Henrietta road bridge and also some test piles between East and West Henrietta roads. Wooden and steel sheet-piling were driven for walls in front of West Henrietta road bridge abutments.

Second-class concrete, plain and reinforced, was placed in Lock No. 33 and its upper guide-wall, by-pass of spillway at Edgewood avenue, lower guide wall of Lock No. 32, retaining wall at north abutment of East Henrietta road bridge and walls at abutments of West Henrietta road bridge.

Wash wall was built on the north side, east of Clover street. Third and fourth-class riprap were placed in the forebay of Lock No. 33.

Large quantities of cement, sand and gravel, and also stone for wash wall and riprap, were received.

Quantities: Excavation, 56,316 cu. yds.; embankment, 54,926 cu. yds.; metal reinforcement, 4,728 lbs.; other metal, 3,315 lbs.; wooden sheet-piling, 9,230 ft. B. M.; steel sheet-piling, 509 sq. ft.; foundation piles, 600 lin. ft.; second-class concrete, 2,443 cu. yds.; wash wall and riprap, 599 cu. yds.

Contract No. 21.— For prism excavation and construction of bridge abutments, guard-lock, etc., from the Genesee river west 2.56 miles to a point just west of the N. Y. C. & H. R. railway crossing.

Pumping for drainage continued, at Scottsville road, Brooks avenue and at west end of contract.

Shovel No. 3 continued excavating in rock cut and shovel No. 4 continued excavating earth west of the B. R. & P. railway crossing. The locomotive crane is stationed at this crossing and has excavated to rock, ready for channeling machines to begin.

At the guard-lock, placing concrete continued. A crusher operated by electricity was installed and is supplying crushed stone for the concrete. Ten steam-drills worked most of the time, ahead of the shovel. Four channelers worked on prism lines in rock.

Quantities: Excavation, 73,332 cu. yds.; concrete, 710 cu. yds.; channeling, 5,757 sq. ft.

Contract No. 82.— For furnishing and erecting three steel highway bridge superstructures on Contract No. 21, near Rochester.

No contract work was done.

Contract No. 75.— For construction of three guard-gate superstructures on Contracts Nos. 60, 61 and 64.

At Spencerport and Brockport guard-gates, reinforcing channels were attached to guides and gates left in position to accommodate traffic. A few minor adjustments of the operating machinery remain to be made.

Contract No. 105.— For the construction of five lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Union street, Spencerport; Washington street, Adams Basin; Park avenue, Brockport; Hulberton; Gasport.

At Washington street bridge, Adams Basin, pits were excavated and concrete placed for north abutment, pit and wings. On the south side concrete for abutment and pit was carried nearly to the top. Considerable steel for the superstructure was delivered at the site.

At Park avenue bridge, Brockport, the coffer-dam enclosing section of wall on south side was completed but not unwatered. On the north side, the old approach was partly removed and excavation started for the abutment pit. The bridge is closed to vehicles, but is still used by pedestrians.

Contract No. 60.— For prism excavation and construction of culverts, bridge structures, etc., between a point 1.75 miles east of South Greece and a point 0.5 mile west of Adams Basin.

The ladder-dredge *Mohawk* continued cleaning up the bottom of the prism east of Spencerport, casting the material on north side of the tow-path.

Excavating was also done by derrick-scow and by teams and scrapers in various places, cleaning up prism and removing spoil piled on the berme.

Considerable puddle material was placed on the bottom of the prism east of bridge No. 95, by depositing from a scow, to check seepage through seamy rock on the bottom. A 6-in. tile drain is being laid at the toe of the bank, to intercept the water and convey it to a drainage ditch.

Wash wall and coping were placed in various places and some paving was done around the drain at culvert No. 43.

Quantities: Excavation, 2,991 cu. yds.; embankment, 1,165 cu. yds.; wash wall, 755 cu. yds.; puddle, 1,155 cu. yds.

Contract No. 61.— For prism excavation and construction of culverts, bridges, waste-weir, etc., between a point 0.5 mile west of Adams Basin and Monroe-Orleans county line.

Excavator No. 1 continued the removal of the old berme bank east of the guard-gate, loading material upon scows which transported it to south embankment near east line of Brockport. Excavator No. 2 cut from north side of prism about one-half mile east of Brockport, sending its material to the same embankment. Excavator No. 3 was idle.

Wash wall was built at various points and paving was laid at bridges Nos. 104, 106 and 109. Some lining was placed on tow-path and on approaches to bridge No. 110. The reinforced concrete sidewalks on bridge No. 109 are completed. Bridge No. 110 has been opened to traffic.

Quantities: Excavation, 5,049 cu. yds.; embankment, 4,975 cu. yds.; wash wall, 3,925 cu. yds.; paving, 143 sq. yds.; lining, 1,265 cu. yds.; wooden fence, 1,772 lin. ft.; reinforced concrete, 15 cu. yds.

Contract No. 62.— For prism excavation and construction of culverts, bridge substructures, etc., between Orleans-Monroe county line and a point near Eagle Harbor bridge.

Albion section:

About 35,000 cu. yds. of material were excavated, by the Bucyrus excavator with drag-bucket on south side near culvert No. 76, the Lidgerwood excavator west of Lattin's bridge, at north abutment of Ingersoll street bridge and by teams and laborers at Albion vertical wall on south side and at culvert No. 82.

About 12,000 cu. yds. of embankment were formed, by the Bucyrus and Lidgerwood excavators and by team outfits on north side between culvert No. 82 and Albion vertical wall.

Some 6,400 cu. yds. of wash wall were built, on north side east of bridge No. 121, and on tow-path side near Gaines bridge.

About 1,700 cu. yds. of concrete were placed, at Albion vertical wall, culvert No. 71, waste-weir, north abutment of Ingersoll street bridge and at bridges Nos. 124 and 125. About 24,000 lbs. of cast-iron pipe were placed at culverts Nos. 76 and 78; 93,000 lbs. of structural steel at bridges Nos. 123, 124 and 125, and 21,000 lbs. of metal reinforcement at Ingersoll street bridge and bridges Nos. 124 and 125.

Other work was in laying wooden pavement at Hall's bridge, painting steel for bridge No. 122, unloading steel for Main street bridge, etc.

Holley section:

About 6,436 cu. yds. were excavated. At County Line borrow-pit, material was placed in north approach of bridge No. 112. About 6,138 cu. yds. of embankment were formed, on tow-path at Tuttle's bridge, and leveling berme west of County Line bridge. About 3,932 cu. yds. of wash wall were built. At Tuttle's bridge 1,389 lin. ft. of wooden fence were built. Paving was also done at this bridge and at culverts Nos. 63 and 64.

Contract No. 64.— For improvement from 600 ft. west of Prospect street, Medina, to 100 ft. east of Gasport bridge.

About 12,300 cu. yds. of material were excavated. The new dipper-dredge began work on July 11. About 3,300 cu. yds. of wash wall were built at various points. Some 1,048 cu. yds. were grubbed. About 400 cu. yds. of embankment were formed. Boats were repaired, buildings moved, etc.

Contract No. 66.— For prism excavation and constructing bridges and approaches, culverts, etc., from 100 ft. east of Gasport bridge to 600 ft. east of Lockport locks.

The total excavation for the month was 1,298 cu. yds.

At Orangeport the dipper-dredge *Peconic* removed 318 cu. yds. of earth and rock from the prism. At culvert No. 119, 46 cu. yds. of first-class embankment were placed and 137 cu. yds. of excavation were removed.

Between Lake avenue and Exchange street, 843 cu. yds. of excavation were removed from the prism by the dipper-dredge *Peconic,* operating in conjunction with a derrick-boat, which placed the spoil on the Odd Fellows Home spoil bank.

At the new approach to Lake avenue bridge, 443 cu. yds. of second-class concrete were placed in the retaining wall and 72 sq. yds. of third-class paving were placed at the south abutment.

At culvert No. 123, south side, 38 sq. yds. of third-class paving were placed.

The gratings were placed in the south ends of culverts Nos. 115½, 116, 117, 119 and 123, making a total of 1,311 lbs. of structural steel.

Contract No. 67.— For construction of Locks Nos. 34 and 35 and approaches, etc., at Lockport.

The total excavation for the month was 1,832 cu. yds. About 1,600 cu. yds. of rock were removed from Lock No. 34 by hand labor, derricks and one train, the balance being the amount taken from Lock No. 35 and Main street bridge abutments in trimming to neat lines.

Concreting in the lower end of Lock No. 34 was continued with the placing of 2,643 cu. yds. Six sections of the south wall of Lock No. 35 were practically completed with the laying of 3,093 cu. yds. Reinforced concrete sidewalks were laid on the east end of Main street bridge and both sides of Transit street bridge.

Quantities: Second-class concrete, 5,736 cu. yds.; reinforced concrete, 50 cu. yds.

Contract No. 40.— For constructing the canal, culvert entrances, guard-gates, stream entrances, bridges, etc., from the Lockport locks to Sulphur Springs guard-lock.

At Summit street bridge, 206 cu. yds. of material were placed in embankment at the north approach; lining was placed on the north slab; 39 cu. yds. of reinforced concrete were laid in the south slab and sidewalk; 49 lin. ft. of lattice railing were erected.

At Riley's bridge, 132 lin. ft. of wooden fence were built at both approaches.

At Hawley's bridge, 45 cu. yds. of material were excavated and 110 cu. yds. were placed in embankment at the north approach; 32 cu. yds. of lining were placed on north slab.

At the guard-gate, the operating machinery was partly installed and painting was continued. About 30,060 lbs. of metal were used and 59 cu. yds. of concrete were placed in the counterweights.

Contract No. 19.— For prism excavation, rebuilding bridges, constructing masonry culvert, concrete-capped pile docking, etc., between Sulphur Springs guard-lock and mouth of Ellicott creek.

The total excavation for the month was 33,009 cu. yds., of which 32,802 cu. yds. were removed by the hydraulic dredge *Niagara* at Three-Mile bend and at Tonawanda, working on double shifts. About 111 cu. yds. were excavated by the clam-shell dredge *Teddy* near the guard-lock. About 96 cu. yds. were borrowed and placed in embankment at Pickard's bridge approach by teams. About 25 cu. yds. of lining and 33 cu. yds. of riprap were also placed here.

Some 4,387 lin. ft. of wooden fencing were built, of which 4,227 lin. ft. were between McDonald's culvert and Pendleton bridge.

The dipper-dredge *Buffalo* cast over about 15,000 cu. yds. at Three-Mile bend. This material was rehandled by the *Niagara*. The pile-driver continued work at Martinsville dock. About 50,000 ft. B. M. of 6-in. sheeting, 43 45-ft. piles and 7 35-ft. piles were driven. The *Lehigh* finished diking on the Murray property near Pickard's bridge and began on the May property at Pendleton.

Champlain Canal.

Contract No. 70.— For dredging a channel in the Hudson river from outlet of Barge canal at Waterford to Lock No. 1.

Contract canceled by order of the Canal Board, July 18, 1912.

Contract No. 71.— For constructing Lock No. 1 and Dam No. 1, above Waterford, and dredging Hudson river from Lock No. 1 to lower Mechanicville lock.

Work continues suspended, pending further action by the Canal Board.

Contract No. 69.— For constructing Lock No. 2, at lower Mechanicville.

About 811 cu. yds. of material were excavated from the tail-race, material being transported to spoil in three-car trains. The gates are riveted and painted. Valves are on lock walls and ready for placing in wells. The surfaces of the concrete bridge sub-structure have been finished. Miter and quoin-posts at the upper gates are being trimmed. The crib at the supper guide wall has been framed and sheeting is being driven.

Contract No. 72.— For dredging Hudson river from lower Mechanicville to Stillwater.

Contract canceled by order of the Canal Board, July 18, 1912.

Contract No. 88.— For the construction of a steel highway bridge at Schuylerville, within the limits of Contract No. 73.

Work at the west pier has progressed slowly. The last pile for the caisson has been driven. After much difficulty the coffer-dam was unwatered the last of the month and excavation with derrick and buckets is in progress.

Contract No. 1.— For dredging Hudson river from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; constructing Crocker's Reef dam and approaches to "Land Line," etc.

Work closed down indefinitely.

Contract No. 24.— For constructing guard-gate at Crocker's Reef.

About 2,150 cu. yds. of shale rock were excavated during the month from the site of the lower approach wall and deposited along the west bank by derricks and skips.

This contract has been assigned by the administrator of James D. Sherrill, to whom this contract was awarded, to The Kingsbury Construction Co., of Hudson Falls, N. Y.

Contract No. 54.— For constructing Lock No. 7, at Fort Edward.

All excavation for lock and approach wall foundations was completed. About 2,000 cu. yds. of earth were excavated from the prism at the north end of the lock. Some 288 lin. ft. of round piles were driven in the southeast approach wall, completing the pile work in the foundations of lock and approach walls. About

3,389 cu. yds. of second-class concrete were placed, completing all foundation courses, including 2 sections of the southeast approach wall, the southwest gate section and 1 section of the west wall. About 500 cu. yds. of riprap stone were delivered, and 100 cu. yds. placed. The steelwork is progressing. The buffer-beam at the upper end of the lock was set and swung. Erection of the southeast gate began and the first two rows of rivets were driven. The quoin-plates for upper gates are set.

Contract No. 27-A.— For completing the construction of the canal between the Hudson river at Fort Edward and the south end of Contract No. 25, at Dunhams Basin road.

Some 486 cu. yds. of material were grubbed from west side of prism. About 10,310 cu. yds. were excavated from spoil banks. Other excavation amounted to 7,612 cu. yds., of which 434 cu. yds. were from wash wall notch on west side, north of East street; 181 cu. yds. at cut-off wall west side of Lock No. 8; 6,341 cu. yds. from prism near Argyle street and 656 cu. yds. from ditch east of canal between East and Argyle streets. About 1,962 ft. B. M. of sheeting and bracing were used at the cut-off wall on west side of Lock No. 8.

Some 3,404 cu. yds. of embankment were formed, of which 372 cu. yds. were at Baldwin avenue bridge and the remainder on west side.

Five 20-ft. foundation piles were driven at power-plant and 34 similar piles and 5,760 ft. B. M. of sheet-piling were driven at the northwest approach wall of Lock No. 7, completing the piling at that structure.

About 345 cu. yds. of concrete were placed in Lock No. 8, 622 cu. yds. in completing the southwest approach wall of the lock, and 383 cu. yds. in the power-plant. About 718 cu. yds. of wash wall were built, on both sides near East street.

About 3,018 lbs. of structural steel, etc., were placed in approach wall and power-plant and 229 lbs. of castings were also used.

Contract No. 25.— For prism excavation between a point 0.6 mile north of Comstock post-office and highway crossing at Dunhams Basin; constructing Lock No. 9, spillways, power-plant, etc.

The total excavation was 53,161 cu. yds., of which the dipper-dredge, working north of Fort Ann, removed 2,646 cu. yds.; the dredge *Champlain* excavated 34,383 cu. yds. and the sloper re-

moved 12,955 cu. yds. About 270 cu. yds. were borrowed, forming 273 cu. yds. of embankment at Smiths Basin bridge, and 2,907 cu. yds. were also borrowed at George Henry's bridge, forming 3,186 cu. yds. of embankment. Some 27 cu. yds. of lining were placed under paving at Smiths Basin bridge and 173 cu. yds. at Brayton's bridge, under paving and on approaches.

About 8,624 ft. B. M. of sheet-piling were driven for baffle-dam and bank protection and 603 cu. yds. of riprap placed at stream entrance at Smith's Basin. Some 313 cu. yds. of second-class paving were laid, 193 cu. yds. of which were at Brayton's bridge and the remainder at Smiths Basin bridge. About 159 lin. ft. of wooden fence were built at Comstock bridge approach.

Oswego Canal.

Contract No. 39.— For dredging channel in Oswego river, constructing stream entrances, excavating through Hinmansville cut-off, etc., between Three River Point and Fulton, except portion covered by Contract No. 53.

Dredging was continued, 37,215 cu. yds. of material being removed.

Contract No. 85.— For constructing a steel bridge over the lock at Phoenix.

No contract work was done.

Contract No. 80.— For constructing a concrete dam across the Oswego river at Phoenix.

About 22 cu. yds. of material were removed from the old dam. Some 1,746 lbs. of metal were used in the Taintor gates.

Contract No. 104.— For the construction of a reinforced concrete arch bridge over the Barge canal at Broadway, Fulton.

Excavating for east abutment began, 113 cu. yds. of material being removed.

Contract No. 10-A.— For completing the construction of the canal, raising the upper dam, etc., from Broadway bridge, Fulton, south to Contract No. 39.

About 1,747 cu. yds. were excavated, 980 cu. yds. coming from spoil on Yelverton island, 399 cu. yds. from prism, 311 cu. yds. from upper dam and balance elsewhere. About 2,100 cu. yds. of embankment were formed, 1,810 cu. yds., being in Yelverton

island dike and 290 cu. yds. on east side. Some 197 cu. yds. of first-class concrete were placed in upper dam and 41 cu. yds. of second-class in setting 2,334 lbs. of cast-iron snubbing posts. About 5 lin. ft. of 30-in. concrete drain were laid and covered.

Contract No. 10-B.— For completing the construction of the canal from the upper end of Lock No. 2, Fulton, north to Contract No. 37.

Excavation and channeling at Lock No. 3 continued, 8,485 cu. yds. being removed and 3,400 sq. ft. of rock surface channeled.

Contract No. 37.— For dredging a channel in Oswego river, constructing Locks Nos. 5 and 6, dams, bulkheads and other structures, and the removal of Battle Island and High dams, between Contract No. 10, at Fulton, and Contract No. 35, at Oswego.

About 18,806 cu. yds. were excavated, of which 12,534 cu. yds. were from prism, 5,460 cu. yds. borrowed for Minetto dike and extension and 808 cu. yds. for tile drain. For this drain 27,700 ft. B. M. of sheeting and bracing were reused. About 6,436 cu. yds. of embankment were formed at Minetto retaining wall, dike and extension and drain referred to.

In catch-basins, some 6 cu. yds. of concrete, 54 lbs. of steel in ladder and 202 lbs. of castings in cover, were used. Some 28 lin. ft. of 6-in. and 685 lin. ft. of 18-in. vitrified pipe and specials were also used.

On road "B," adjacent, some 14,463 cu. yds. were excavated, mostly from borrow-pit and 12,344 cu. yds. of embankment were formed. 81 cu. yds. of concrete, using 1,037 lbs. of reinforcement, were laid at culverts.

Contract No. 35.— For prism excavation and constructing Locks Nos. 7 and 8, bulkheads, culverts, spillways, etc., between a point one-half mile above Utica street bridge and harbor line north of Bridge street, at Oswego.

About 8,670 cu. yds. were excavated at the west wall and in prism near Lock No. 7. About 4,572 ft. B. M. of sawed lumber and 7,270 lbs. of structural steel were used at the hydraulic canal bulkhead. About 2,726 cu. yds. of concrete were laid in west retaining wall and east upper approach wall of Lock No. 7.

Cayuga and Seneca Canal.

Contract A.— For constructing Lock No. 1 and Dam No. 1, near Cayuga.

About 370 cu. yds. of concrete were placed in the north end of the east lock wall, completing the two walls; 450 cu. yds. were laid in the lock floor at the north end and 800 cu. yds. in the northeast approach wall. About 880 cu. yds. of material were excavated from the lock chamber and about one-third of the east wall has been backfilled.

At the site of the dam, the coffer has caused considerable trouble, requiring work on it about half the time. The pit for Pier No. 2 has been excavated and about 75 per cent of the foundation piles driven. Wooden sheeting was driven at the dam. About 2,000 cu. yds. were excavated, but nearly all of it was used in maintaining the coffer-dam.

Contract B.— For excavating a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from Cayuga lake to Seneca Falls and from Waterloo to deep water in Seneca lake.

The dredge *Clyde* excavated 230,243 cu. yds. of material from the prism during the month.

Contract H.— For excavating a channel in Cayuga lake inlet at Ithaca from a point about 300 feet north of Cascadilla street, to deep water in Cayuga lake.

Contract work not yet begun.

Water-Supply.

Contract No. 50.— For constructing dam, waste-gates and spillway across West Canada creek at Hinckley.

Excavation progressed for abutments at both ends of the dam. Excavating for the north gate-house and spillway section began, the plant being increased to a cableway, three derricks and a Thew shovel at the end of the month. Material was deposited in the river above the dam. Some backfilling was done along the core wall trench. A steam-shovel excavated material from an area east of the south end of the dam, which was deposited by trains on both sides of the core wall, spread in layers and rolled. The pond on the east side of the core wall was drained. The embankment

is now free from standing water. Some concrete was placed in the south gate-chamber. Cyclopean masonry was placed in the north abutment of the dam. Third-class riprap and lining were being placed most of the month with the crane. The cableway was placed in operation. Pumps were installed to unwater the coffer-dam.

Quantities: Excavation, 6,256 cu.yds.; embankment, 19,438 cu. yds.; lining, 408 cu. yds.; concrete, 171 cu. yds.; Cyclopean masonry, 281 cu. yds.; riprap, 882 cu. yds.; castings, 3,540 lbs.

Contract No. 51.— For constructing a canal feeder from Trenton Falls on West Canada creek to Nine-Mile creek below South Trenton, with gate-house, culverts, highway, etc.

About 22,622 cu. yds. of material were excavated, of which Browning shovel No. 1 removed 8,500 cu. yds. from the feeder prism near the intake; excavator "K," working in the heavy cut at Cincinatus creek, removed 7,800 cu. yds.; the two traveling derricks, equipped with orange-peel buckets, removed about 3,700 cu. yds. and about 2,600 cu. yds. were removed by teams from drainage ditch, culverts and various parts of the prism.

The abutments for one highway culvert were completed, and 260 cu. yds. of concrete were placed in another culvert.

Contract No. 55.— For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black River canal, with four locks and aqueduct over Mohawk river, highway change, bridges, etc.

Some 314 cu. yds. of material were removed by grubbing. About 4,224 cu. yds. were excavated and 3,151 cu. yds. of embankment were formed. Some 11 cu. yds. of second-class concrete, 58 sq. yds. of first-class, 64 sq. yds. of second-class and 68 sq. yds. of cobblestone paving were placed. About 367 cu. yds. of third-class and 58 cu. yds. of fourth-class riprap were placed.

Construction work has been completed, plant is being dismantled and shipped and final estimates are being prepared.

Contract No. 55-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 55, Delta reservoir, to a new cemetery outside the flow lines.

This contract is completed and final estimates are being prepared.

POWER-SUPPLY.

Contract No. 91.— For building and equipping a hydro-electric power-plant on the Erie canal near the east end of Crescent dam.

About 82 cu. yds. of first-class reinforced concrete were placed, of which 7 cu. yds. completed the floor of the superstructure and 73 cu. yds. were in walls, completing 3 sections to the elevation of the crane-rail.

Cast-iron stairs were placed in the substructure. Floor stands and shafting for operating butterfly-valves were placed.

Some material was removed from the coffer-dam and sheeting pulled.

Contract No. 90.— For constructing hydro-electric power-plants at Baldwinsville on the Erie canal, and at Smiths, Comstock and Whitehall on the Champlain canal. Also for constructing equipment for operating and lighting the following locks: No. 24, Erie canal; Nos. 1, 2, 7 and 8, Oswego canal; Nos. 9, 11 and 12, Champlain canal.

On the Erie canal: At Lock No. 24 final tests were made.

On the Champlain canal: At Lock No. 9 contract work finished and installation ready for final tests.

On the Oswego canal: At Lock No. 7 588 lbs. of insulated conductor were placed.

Progress of Plans Being Prepared.

The following pages contain detailed accounts of the plans in process of preparation at the main and residency offices, showing progress up to the first of August. An order according to location is followed, as explained in the account of contract work for the month.

ERIE CANAL.

Contract No. 74.— For dredging Mohawk river from Hudson river to Contract No. 2-E. Plans completed.

Contract No. 18-A.— For completing the construction of the canal from Mindenville to Castle creek. Plans 83 per cent completed.

Contract No. 84.— For the construction of two steel lift bridges at Clyde, within the limits of Contract No. 47. Work on plans suspended, pending an investigation as to elimination of grade crossing.

Contract No. 59.— For constructing a movable dam in the Genesee river at Rochester. Plans 90 per cent completed.

Contract No. 106.— For the construction of four lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Exchange street, Lockport; Middleport; Prospect street, Medina; Main street, Brockport. Plans 96 per cent completed.

Contract No. 65.— For work from the west end of Contract No. 9, at a point near Beal's bridge, to the east end of Contract No. 64, at a point 600 feet west of Prospect street, Medina, including Oak Orchard creek crossing. Plans 78 per cent completed.

Oswego Canal.

Contract No. 37-R.— For the removal of bodies from the Minetto cemetery, within the limits of Contract No. 37, to a new cemetery outside the flow line. Plans 95 per cent completed.

Cayuga and Seneca Canal.

The contracts on this canal may be rearranged. For the present the old order is retained.

Contract C.— For constructing Lock No. 2 and Dam No. 2, near Demont's bridge. Plans under revision.

Contract D.— For constructing Lock No. 3 and excavating prism east of Seneca Falls. Plans under revision.

Contract E.— For constructing Lock No. 4 at Seneca Falls, three highway bridges, etc. Plans 70 per cent completed.

Contract G.— For dredging a channel in the Seneca river from Lock No. 4, at Seneca Falls, to Contract B, at Waterloo. Plans 50 per cent completed.

Contract F.— For constructing Lock No. 5 and dam at Waterloo. Plans 55 per cent completed.

Contract J.— For improving Glen creek from the highway bridge in the village of Watkins to the canal improvement. Plans under way.

POWER-SUPPLY.

Contract No. 92.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 2 to 19, inclusive, on the Erie canal, and Locks Nos. 1 to 8, inclusive, on the Champlain canal. Plans 95 per cent completed.

Plans before Canal Board.

Contract No. 70-A.— For the completion of the work remaining to be done on Contract No. 70. Plans approved by the Canal Board, July 30, 1912.

Contract No. 72-A.— For the completion of the work remaining to be done on Contract No. 72. Plans approved by the Canal Board, July 30, 1912.

Contract No. 56.— Glens Falls feeder. Plans approved by Canal Board, July 11, 1912.

Contract No. 103.— For the construction of a reinforced concrete arch bridge over part of the Oswego river at Phoenix. Plans approved by Canal Board, May 12, 1912.

Contract I.— For improving the canal from deep water in Seneca lake to Montour Falls, about 2.75 miles. Plans approved by Canal Board, July 11, 1912.

Contract Advertised.

Contract I., listed under the preceding heading, has been advertised, bids to be opened September 4, 1912.

Award of Contracts.

The detailed bids of the following contracts appear elsewhere.

Contract No. 101.— For the construction of a steel highway bridge superstructure at Three River Point. Bids opened July 30, 1912. Five bids were received, the lowest of which was by Barrally & Ingersoll, 853 Powers Building, Rochester, N. Y., to whom it was subsequently awarded at $40,639.50.

Contract No. 57.— For constructing the canal through Onondaga lake outlet. Bids opened July 30, 1912. Two bids were received, the lowest of which was by the New York State Dredging Corporation, 853 Powers Building, Rochester, N. Y., to whom it was subsequently awarded at $93,596.

Contract No. 22-A.— For constructing a new substructure, approach spans and approaches for a bridge over the Erie canal at Weedsport. Bids opened July 30, 1912. Four bids were received, the lowest being that of Lupfer & Remick, Buffalo, N. Y., to whom it was subsequently awarded at $27,099.20.

Contract No. 90-A.— For constructing hydro-electric power-plants, sub-stations and equipments to complete installations at Locks Nos. 1, 2, 7 and 8, Oswego canal. Bids opened July 30, 1912. One bid was received, that of Lupfer & Remick, Buffalo, N. Y., to whom it was subsequently awarded at $64,020.20.

RECAPITULATION — PROGRESS ON PLANS.

Contract No.	DESCRIPTION.	Canal.	Progress on plans.
18A	Mindenville to Castle creek	Erie	83 per cent completed.
22A	Bridge approaches, etc., at Weedsport	Erie	Awarded.
37R	Removal of bodies at Minetto	Oswego	95 per cent completed.
56	Glens Falls feeder	Champlain	Approved by Canal Board.
57	Onondaga lake outlet	Erie	Awarded.
59	Rochester harbor dam	Erie	90 per cent completed.
65	Canal and aqueduct at Medina	Erie	78 per cent completed.
70A	Supplemental to Contract 70	Champlain	Approved by Canal Board.
72A	Supplemental to Contract 72	Champlain	Approved by Canal Board.
74	Dredging Hudson river to Contract 2-E	Erie	Completed.
84	Two lift-bridges at Clyde	Erie	Suspended.
90A	Supplemental to Contract 90	Oswego	Awarded.
92	Power-house and lock equipments	Erie, Champlain	95 per cent completed.
101	Bridge at Three River Point	Erie	Awarded.
103	Bridge at Phoenix	Oswego	Approved by Canal Board.
106	Bridges on Contracts 61, 64, 65 and 67	Erie	96 per cent completed.
C	Lock 2, near Demont's bridge	Cayuga and Seneca	Under revision.
D	Lock 3 and prism, east of Seneca Falls	Cayuga and Seneca	Under revision.
E	Lock 4 at Seneca Falls	Cayuga and Seneca	70 per cent completed.
F	Lock 5 and dam at Waterloo	Cayuga and Seneca	55 per cent completed.
G	Dredging, Seneca Falls to Waterloo	Cayuga and Seneca	50 per cent completed.
I	Watkins to Montour Falls	Cayuga and Seneca	Approved by Canal Board.
J	Glen creek at Watkins	Cayuga and Seneca	Under way.

BIDS FOR CONTRACT No. 101.

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		BARRALLY & INGERSOLL, 853 POWERS BLDG., ROCHESTER, N. Y.		JOHN YOUNG, 1705 S. SALINA ST., SYRACUSE, N. Y.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.
Coffer-dams, pumping, bailing and draining	lump sum	1	$2,000 00	$2,000 00	$2,000 00	$2,000 00	$2,000 00	$2,000 00
Excavation	cu. yd	15,500	70	10,850 00	50	7,750 00	60	9,300 00
Forming embankment for bridge approaches	"	14,100	15	2,115 00	15	2,115 00	15	2,115 00
Lining	"	149	1 50	223 50	1 50	223 50	1 50	223 50
Treated yellow pine sawed lumber	M. ft. B. M.	30	60 00	1,800 00	60 00	1,800 00	60 00	1,800 00
Foundation piles	lin. ft	6,550	30	1,965 00	30	1,965 00	30	1,965 00
Second-class concrete	cu. yd	1,720	7 00	12,040 00	6 50	11,180 00	7 00	12,040 00
Third-class concrete	"	63	6 00	378 00	6 00	378 00	6 00	378 00
Third-class stone paving	sq. yd	10	1 50	15 00	1 50	15 00	1 50	15 00
Structural steel	lb	309,000	04	12,360 00	04	12,360 00	04	12,360 00
Metal reinforcement	"	1,100	03	33 00	03	33 00	03	33 00
Wooden fence	lin. ft	4,100	20	820 00	20	820 00	20	820 00
Total				$44,599 50		$40,639 50		$43,049 50

BIDS FOR CONTRACT No. 101 — (*Continued*).

ITEMS.	Measure.	Quantities.	FRANK COHEN, 49 NIAGARA ST., BUFFALO, N. Y.		OWEGO BRIDGE CO., OWEGO, N. Y.		LUPPER & REMICK, BUFFALO, N. Y.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.
Coffer-dams, pumping, bailing and draining	lump sum	1	$2,400 00	$2,400 00	$2,000 00	$2,000 00	$2,400 00	$2,400 00
Excavation	cu. yd	15,500	68	10,540 00	75	11,625 00	70	10,850 00
Forming embankment for bridge approaches	"	14,100	08	1,128 00	15	2,115 00	15	2,115 00
Lining	"	149	1 50	223 50	1 50	223 50	1 80	268 20
Treated yellow pine sawed lumber	M. ft. B. M.	30	60 00	1,800 00	60 00	1,800 00	60 00	1,800 00
Foundation piles	lin. ft.	6,550	36	2,358 00	35	2,292 50	36	2,358 00
Second-class concrete	cu. yd	1,720	6 90	11,868 00	7 50	12,900 00	8 00	13,760 00
Third-class concrete	"	63	6 50	409 50	7 00	441 00	7 00	441 00
Third-class stone paving	sq. yd	10	1 50	15 00	1 50	15 00	1 50	15 00
Structural steel	lb	309,000	04½	13,905 00	04½	13,905 00	04½	13,905 00
Metal reinforcement	"	1,100	04	44 00	03	33 00	03	33 00
Wooden fence	lin. ft.	4,100	20	820 00	20	820 00	20	820 00
Total	.....	.....	.....	$45,511 00		$48,170 00		$48,765 20

BIDS FOR CONTRACT NO. 57.

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		N. Y. STATE DREDGING CORPORATION, 853 POWERS BUILDING., ROCHESTER, N. Y.		JAMES STEWART & Co., 30 CHURCH ST., N. Y. CITY.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.
Acres clearing	lump sum	20	$500 00	$500	$600 00	$600	$550 00	$550 00
Excavation	cu. yd	200,700	25	50,175	28	56,196	27½	55,192 50
Second-class riprap	"	3,700	3 50	12,950	4 00	14,800	3 50	12,950 00
Fourth-class riprap	"	8,000	2 50	20,000	2 50	20,000	2 90	23,200 00
Maintaining highway traffic	lump sum	.....	2,000 00	2,000	2,000 00	2,000	2,200 00	2,200 00
Totals	.....	.....	.....	$85,625	.....	$93,596	.....	$94,092 50

BIDS FOR CONTRACT NO. 22-A.

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		OWEGO BRIDGE CO., OWEGO, N. Y.		JAMES STEWART & CO., 30 CHURCH ST., N. Y. CITY.		BARRALLY & INGERSOLL, 853 POWERS BLDG., ROCHESTER, N. Y.		LUPFER & REMICK, BUFFALO, N. Y.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.
Excavation	cu. yd	4,000	$1 00	$4,000	$1 20	$4,800 00	$3 00	$12,000	$1 50	$6,000	$0 50	$2,000 00
Lining	"	234	1 50	351	1 80	421 20	2 50	585	1 50	351	1 80	421 20
Treated yellow pine sawed lumber	M. ft. B. M.	17	60 00	1,020	72 00	1,224 00	80 00	1,360	60 00	1,020	72 00	1,224 00
Furnishing and delivering foundation piles	lin. ft	6,000	15	900	18	1,080 00	25	1,500	15	900	18	1,080 00
Driving foundation piles	"	7,000	20	1,400	24	1,680 00	40	2,800	20	1,400	24	1,680 00
Second-class concrete	cu. yd	680	8 00	5,440	9 60	6,528 00	14 00	9,520	8 00	5,440	9 60	6,528 00
Structural steel	lb.	129,000	04½	5,805	054	6,966 00	07	9,030	04½	5,805	054	6,966 00
Maintaining highway traffic	lump sum	.....	3,000 00	3,000	3,600 00	3,600 00	4,500 00	4,500	4,000 00	4,000	3,600 00	3,600 00
Coffer-dams, pumping, bailing, and draining	"	.....	3,000 00	3,000	3,600 00	3,600 00	4,000 00	4,000	4,000 00	4,000	3,600 00	3,600 00
Total	.....	.....	.....	$24,916	....	$29,899 20		$45,295		$28,916		$27,099 20

BID FOR CONTRACT NO. 90-A.

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		LUPFER & REMICK, BUFFALO, N. Y.	
			Price.	Amount.	Price.	Amount.
Excavation	cu. yd	1,170	$0 80	$936 00	$0 80	$936 00
Chipping concrete	cu. ft	104	1 50	156 00	1 50	156 00
Chipping edges of machinery recesses	lin. ft	95	30	28 50	30	28 50
Sheeting and bracing	M. ft. B. M.	4.5	50 00	225 00	50 00	225 00
Forming embankment	cu. yd	1,020	35	357 00	35	357 00
First-class concrete	"	24	12 00	288 00	14 40	345 60
Second-class concrete	"	137	10 00	1,370 00	12 00	1,644 00
First-class reinforced concrete	"	400	20 00	8,000 00	24 00	9,600 00
Lining	"	12	1 50	18 00	1 50	18 00
Structural steel	lb	16,800	06	1,008 00	06	1,008 00
Metal reinforcement	"	32,300	03½	1,130 50	03½	1,130 50
Iron castings, machined	"	5,400	07	378 00	07	378 00
Drilling 1¼-inch holes	lin. ft	20	1 00	20 00	1 00	20 00
Drilling 3-inch holes	"	26	2 00	52 00	2 00	52 00
Squares roofing	square	32.6	55 00	1,793 00	66 00	2,151 60
Painting concrete	sq. yd	900	20	180 00	20	180 00
Electrical equipment, Lock No. 1	lump sum	1	7,500 00	7,500 00	5,500 00	5,500 00
Electrical equipment, Locks Nos. 2 and 7	No.	2	7,000 00	14,000 00	5,500 00	11,000 00
Electrical equipment, Lock No. 8	lump sum	1	800 00	800 00	800 00	800 00
Hydraulic equipment, Locks Nos. 2 and 7	No.	2	4,850 00	9,700 00	4,575 00	9,150 00
Traveling cranes	"	3	400 00	1,200 00	480 00	1,440 00
Doors, windows and woodwork	lump sum	3	400 00	1,200 00	480 00	1,440 00
Maintenance accessories, Lock No. 1	"	1	100 00	100 00	100 00	100 00
Maintenance accessories, Locks Nos. 2 and 7	No.	2	500 00	1,000 00	500 00	1,000 00
Electric capstans, complete	"	6	1,600 00	9,600 00	1,920 00	11,520 00
Coffer-dams, pumping, bailing and draining	lump sum	1	200 00	200 00	240 00	240 00
Total				$64,840 00		$64,020 20

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SEPTEMBER, 1912

Barge Canal Bulletin

Series V No. 9

DEPARTMENT OF

THE STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
ALEXANDER E. KASTL, Special Deputy State Engineer

ISSUED MONTHLY UNDER THE AUTHORITY OF THE STATE ENGINEER, BY THE BUREAU OF PUBLICATION AND REPORTS, DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR

CONTENTS

Progress of Contract Work..... 270
Brief Account of Contract Work for August..... 272
Progress of Plans Being Prepared..... 297
Plans before Canal Board..... 299
Contracts Advertised..... 299
Award of Contract..... 300

Progress of Contract Work.

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Sept. 1, 1912.
		Put under contract *	Done to Sept. 1, 1912.	Done during Aug., 1912.	
1	Empire Engineering Corporation	$580,424	$474,400	0	81.8
2	Ferguson Contracting Company *a*	990,076	694,390	0	70.1
2E	Holler & Shepard *b*	(307,023)	266,330	$9,810	86.8
3	Sundstrom & Stratton	657,273	633,290	0	Finished.
4	Empire Engineering Corporation	726,780	720,073	0	Finished.
4B	E. J. Doyle & Company	1,351	1,332	0	Finished.
5	Empire Engineering Corporation *a*	156,941	125,820	0	80.2
5A	James Stewart & Company *b*	(317,597)	197,550	104,410	62.2
6	F. A. Maselli	1,026,550	1,033,864	0	Finished.
7	Groton Bridge Company	101,930	98,929	0	Finished.
8	Pittsburg-Eastern Company *a*	1,516,789	920,420	0	60.7
8A	The Foundation Company *b*	(799,399)	0	0	0.0
9	Thomas Crimmins Contracting Co	803,297	655,461	0	Finished.
10	McDermott Contracting Company *a*	1,177,348	668,360	0	56.8
10A	The T. A. Gillespie Company *b*	(174,514)	77,530	21,670	44.4
10B	Oswego Construction Co., Inc. *b*	(487,545)	52,860	22,490	10.8
11	Fort Orange Construction Co	1,333,199	1,186,180	9,020	89.0
12	James Stewart & Company	3,558,146	2,549,750	51,930	71.8
13	Penn Bridge Company	28,126	20,180	0	71.7
14	Acme Engr'g & Contracting Co	2,985,225	2,519,640	14,560	84.4
14R	Thomas F. Riley	724	620	150	Finished.
15	Atlantic, Gulf & Pacific Company	1,481,692	1,378,956	0	Finished.
16	United Construction Company	82,440	71,710	3,850	87.0
17	The Scofield Company *a*	842,418	57,560	0	Finished.
17	Alexander Murdoch *b*	(812,286)	744,290	530	Finished.
18	Kelley Bros. Contracting Company	611,382	476,979	0	Finished.
19	Great Lakes Construction Company	891,401	745,940	6,310	83.7
20A	Houston Barnard	490,837	289,660	19,370	59.0
20B	S. Pearson & Son, Inc	1,032,210	435,440	53,910	42.2
20C	American Pipe & Construction Co	585,720	577,940	30,520	98.6
20D	American Pipe & Construction Co	2,685,477	196,600	74,200	7.3
21	Lane Brothers Company	1,323,150	692,940	29,650	52.3
22	M. Fitzgerald	127,521	39,806	8,280	31.2
22A	Lupfer & Remick	27,099	0	0	0.0
23	Millard & Lupton Company	1,808,797	996,510	37,930	55.0
24	Kingsbury Construction Company	44,368	13,550	5,710	30.5
25	Atlantic, Gulf & Pacific Company	1,707,192	1,517,780	17,810	89.0
26	Lake Erie Dredging Company	40,057	35,443	0	Finished.
27	Kinser Construction Company *a*	723,269	378,650	0	Finished.
27A	Holler & Shepard *b*	(449,192)	199,640	19,230	44.5
29	Maryland Dredging & Contr'g Co	691,250	436,530	15,600	63.2
30	Acme Engr'g & Contracting Co	2,660,461	1,448,520	104,260	54.4
31	Casey & Murray	831,302	738,310	9,556	88.9
32	Penn Bridge Company	46,797	44,375	0	Finished.
33	Penn Bridge Company	175,537	165,183	633	Finished.
34	M. Fitzgerald	22,449	22,258	0	Finished.
35	Gilmour-Horton-Allen Company	760,917	627,270	34,050	82.5
36	J. D. Miller	46,800	46,800	0	Finished.
37	Henry P. Burgard	2,462,609	1,081,040	51,200	43.9
38	Henry Tosh & Son	16,870	16,287	0	Finished.
39	James Stewart & Company	1,048,674	230,720	0	22.0
40	United Engr'g & Contracting Co	2,252,144	1,736,140	2,550	77.1
41	Butler Bros. Construction Company	273,238	241,644	0	Finished.
42	Shanley-Morrissey, Inc. *a*	1,047,366	478,670	0	45.7
43	M. A. Talbot Company	1,413,016	272,100	28,100	19.2
44	Scott Brothers	1,756,392	884,170	50,610	50.3
45	Scott Brothers	472,802	418,652	0	Finished.
46	Kinser Construction Company	1,291,805	722,880	22,260	56.0
47	Crowell-Sherman-Stalter Company	1,279,328	830,850	18,160	65.0
48	Crowell-Sherman-Stalter Company	1,676,576	790,290	82,060	47.2
49	American Pipe & Construction Co	735,227	525,710	18,300	71.5
50	Buffalo Dredging Company	971,769	209,040	12,250	21.5
51	Alto Construction Company	397,093	137,190	14,200	34.5
53	Scott Brothers	167,585	164,576	0	Finished.
54	Hunkin-Conkey Construction Co	250,590	170,090	25,330	67.9
55	Arthur McMullen	945,840	883,350	0	93.3
55R	Joseph Kalk & Alfred S. Brown	7,561	7,526	86	Finished.
57	New York State Dredging Corp	93,596	0	0	0.0

Progress of Contract Work—(*Continued*).

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Sept. 1, 1912.
		Put under contract *	Done to Sept. 1, 1912.	Done during Aug., 1912.	
60	Empire Engineering Corporation	$1,491,317	$1,283,550	$4,860	86.1
61	Cleveland & Sons Company	1,090,853	842,300	24,780	77.2
62	I. M. Ludington's Sons, Inc	2,515,043	1,593,000	59,520	63.4
63	H. S. Kerbaugh, Inc	2,349,697	1,410,480	26,640	60.1
64	Empire Engineering Corporation	1,335,434	805,410	20,360	60.3
66	Empire Engineering Corporation	854,394	760,370	2,420	89.0
67	Larkin & Sangster	1,208,110	694,530	57,490	57.5
68	Shanley-Morrissey, Inc	1,024,282	946,168	0	Finished.
69	I. A. Hodge & Company	240,206	208,400	3,020	86.7
70	Shanley-Morrissey, Inc.*a*	779,636	236,240	0	30.3
71	Shanley-Morrissey, Inc.*a*	1,561,119	821,960	0	52.7
72	Shanley-Morrissey, Inc.*a*	1,221,112	618,900	0	52.3
73	E. M. Graves	518,829	517,223	0	Finished.
75	United Construction Company	42,917	40,980	30	Finished.
76	The T. A. Gillespie Company	1,512,011	777,230	18,750	51.3
77	The T. A. Gillespie Company	1,701,808	1,114,920	52,430	65.4
78	Cunningham-Woodard Company	49,026	50,068	2,345	Finished.
79	Lupfer & Remick	37,480	33,980	0	Finished.
80	Walter Bradley	117,391	109,700	0	Finished.
82	Groton Bridge Company	28,841	21,320	0	73.9
85	Lupfer & Remick	13,151	12,010	0	91.3
86	Lathrop, Shea & Henwood Company	43,440	4,940	0	11.3
88	Lathrop, Shea & Henwood Company	25,658	3,760	3,240	14.7
89	Owego Bridge Company	59,616	0	0	0.0
90	D'Olier Engineering Company	180,318	168,680	320	93.5
90A	Lupfer & Remick	64,020	360	360	0.5
91	The Hollington Company	44,985	19,800	920	44.1
101	Barrally & Ingersoll	40,639	1,680	1,680	4.1
104	R. B. Murdock	39,370	590	250	1.5
105	Skene & Richmond	258,710	20,700	5,340	8.0
	Totals	$74,394,216	$48,195,727	$1,315,294	.....

Cayuga and Seneca Canal.†

A	Scott Brothers	$357,627	$192,920	$20,050	54.0
B	Crowell-Sherman-Stalter Company	1,436,597	670,190	32,310	46.7
H	James H. Dawes	205,649	0	0	0.0
	Totals	$1,999,873	$863,110	$52,360	.....

* Includes all alterations in force to date.
a Suspended by order of the Canal Board.
b Relet to complete former contracts, contract price not included in total.
† Authorized by separate appropriation.

Brief Account of Contract Work for August.

The following pages show what has been done during the month on the several contracts now in force on the Barge canal. The Erie canal contracts are described in order from Waterford west to Buffalo, and the Champlain and Oswego canal contracts follow, in order from south to north, while the Cayuga and Seneca canal contracts are given from east to west.

Erie Canal.

Contract No. 16.— For eleven steel highway bridges, ten of which are at various points on Contracts Nos. 25 and 27, Champlain canal, and the remaining one on Contract No. 11, Erie canal.

On Contract No. 11, work began August 15. Steel and lumber were all delivered, falsework placed and south span of the bridge erected.

On Contract No. 25, no work was done.

On Contract No. 27-A, the floor of the Broadway bridge was completed and painting finished. This completes the work which can be done on Contract 27-A until new abutments are built at East and Argyle streets.

Contract No. 13.— For three bridge superstructures on Contract No. 12 and two on Contract No. 18.

No contract work was done.

Contract No. 2-E.— For completing the construction of the canal from the Mohawk river at Waterford to a point about one-fourth mile above the head of Lock No. 3.

Below Lock No. 2, 14,000 ft. B. M. of yellow pine facing timber, 1,450 lin. ft. of round timber and 323 cu. yds. of stone filling were placed. About 434 cu. yds. of embankment were formed behind the crib and dock wall on the south side of canal.

On the guide pier above Lock No. 3, 392 cu. yds. were excavated and 110 cu. yds. of embankment formed. About 773 cu. yds. of second-class and 79 cu. yds. of reinforced concrete were laid. This completes 15 piers and 5 bridges. The following materials were also placed: 300 lbs. of cast-iron snubbing-posts; 150 lbs. of structural steel; 14,835 lbs. of metal reinforcement; 4,022 lin. ft. of foundation piles.

Contract No. 11.— For prism excavation and construction from Contract No. 2 to Mohawk river below Crescent, including Locks Nos. 4, 5 and 6, highway, bridge abutments, guard-gate, masonry, etc.

About 808 cu. yds. of second-class concrete were placed, of which 495 cu. yds. completed the south retaining wall of Lock No. 6, 197 cu. yds. completed the docking between Locks Nos. 4 and 5 and 113 cu. yds. were placed in snubbing-posts, etc.

The Page bucket removed about 2,500 cu. yds. from borrow-pit below Lock No. 4 and placed it in embankment along the north and south core walls of the lock. About 260 cu. yds. were removed in cleaning out the prism below Lock No. 6, and placed an embankment behind the north approach wall. The Vulcan shovel removed 3,700 cu. yds. from the rock cut, which was used as embankment south of Lock No. 4 or spoiled at the river bank. About 532 sq. ft. were channeled at the rock cut. The bank was stripped on the north side and a 12-in. vitrified pipe-culvert with catch-basin placed.

Contract No. 14.— For work from Contract No. 11 to a point near Rexford Flats aqueduct, including Lock No. 7 and Dams Nos. 2 and 3; also for constructing Locks Nos. 13, 14 and 15, Dams Nos. 9, 10 and 11, Mindenville retaining dam, etc.

At Dam No. 2, Crescent, preparations were made for closing openings in dam. Work progressed at the quarry, the crusher plant was repaired, derrick-boat rigged, old coffer-dam pulled, etc.

At Dam No. 3, Lock No. 7, Vischers Ferry, about 810 cu. yds. of stone and concrete were removed from the old dam of the Watervliet Hydraulic Co. near Dunsbach Ferry, completing the work. In the prism and lower approach to Lock No. 7, about 5,500 cu. yds. of material were removed. In foundations for north and middle sections of Dam No. 3, about 720 cu. yds. were excavated. Some 870 cu. yds. of embankment were placed at the lower approach walls of Lock No. 7.

About 102 cu. yds. of first-class and 390 cu. yds. of second-class concrete were placed in north section, 423 cu. yds. in middle section of Dam No. 3 and 123 cu. yds. in snubbing-posts of lower approach of lock. Some 58 cu. yds. of wash wall were built at core wall of lock. About 227 lbs. of structural steel and 27 lbs. of castings were used in flash-board sockets on the dam. In the snubbing-posts for lower approach walls of the lock 7,007 lbs. of casting were used.

A 12-in. rotary pump was set up to unwater the prism below the lock, a cableway was erected across the south channel, etc.

At Dam No. 9, Lock No. 13, Yosts, the coffer-dam in front of the lower guide wall was removed, grading behind walls was in progress and most of the remaining riprap was placed.

At Dam No. 10, Lock No. 14, Canajoharie, the coffer-dam around the south span is being removed.

At Dam No. 11, Lock No. 15, Fort Plain, the drainage ditch back of the lock was cleaned out. Material excavated from coffer-dam in front of lower guide wall was used for grading in rear. Riprap for the lock was completed.

Contract No. 14-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 14 to new burial plots outside the flow lines.

The work on this contract is practically completed.

Contract No. 20-D.— For dredging Mohawk river channel, constructing stream entrances, etc., between deep water below Rexford Flats aqueduct and center of bridge at Dam No. 9, at Yosts.

At the aqueduct, the upper end of the coffer-dam was repaired, flash-boards placed on the State dam, and stripping and drilling rock began. About 600 cu. yds. of loose rock were removed to spoil on the south side of the river.

At the south upper guide wall of Lock No. 10, about 10,600 cu. yds. of material were spoiled by the hydraulic dredge *Amsterdam.* The dipper-dredge excavated about 31,300 cu. yds. from prism, placing it with dump-scows in the south channel back of Davey's island. The dredge *Amsterdam* also removed 81,932 cu. yds. from prism, spoiling it on both sides.

At Tribes Hill, about 829 cu. yds. of rock were removed to spoil. The hydraulic dredge *Mohawk* also excavated about 37,203 cu. yds. from prism, spoiling it on the south side.

At Danoscara creek, about 117 cu. yds. were excavated and 67 cu. yds. of riprap, 63 sq. yds. of paving and 12 cu. yds. of lining placed.

Contract No. 8-A.—For constructing Dam No. 4 and Lock No. 8 at Scotia and other incidental work pertaining to the completion of the locks at Rotterdam and Cranesville.

At Dam No. 4, Lock No. 8, Scotia, preliminary work continued; erecting office buildings on both sides of the river, cement

house, machine shop, storehouses, oil house, building for "Sand-Hogs," mixer and bins, etc.; also erecting derricks, repairing and floating derrick-boat, placing boilers and compressors, unloading lumber, plant and caisson locks, building wharf, etc.

The derrick-boat cut through the old coffer-dam to reach the north side of the river, where it is planned to begin work.

Contract No. 17.— For constructing Dam No. 7 and Lock No. 11, at Amsterdam, and Dam No. 8 and Lock No. 12, at Tribes Hill.

The dam has been cleaned of gravel so that gates and uprights can be seated. The contract work is now complete, except for the removal of coffer-dams and repair of upper gates of Lock No. 12.

Contract No. 20-C.— For dredging Mohawk river channel, constructing stream entrances, etc., between center of bridge at Dam No. 9, at Yosts, and center of bridge at Dam No. 10, at Canajoharie.

The dipper-dredge No. 1 excavated about 37,969 cu. yds. from prism, material being spoiled in deep water and in back channel by dump-scows. The hydraulic dredge placed about 18,125 cu. yds. of prism material in spoil on south side.

At Flat creek, about 16 cu. yds were excavated, and 57 sq. yds. of paving, 10 cu. yds. of riprap and 31 cu. yds. of lining were laid.

At stream entrances, about 67 cu. yds were excavated, and 123 sq. yds. of paving, 40 cu. yds. of riprap and 48 cu. yds. of lining were placed.

At Canajoharie creek, about 31 cu. yds. of lining were also placed. A large dump-scow was completed and put in commission.

Contract No. 86.— For the construction of one span of a highway bridge over the Mohawk river at Canajoharie, to replace two existing spans, which will be removed.

No work was done, except the construction of a temporary bridge below the present structure. Nearly 400 lin. ft. of this temporary bridge has been erected.

Contract No. 20-B.— For dredging Mohawk river channel, constructing stream entrances, etc., between the center of bridge at Dam No. 10, at Canajoharie, and the upper miter wall of the new lock at Mindenville.

The two dipper-dredges and the hydraulic disposal boat continued operations, placing about 79,950 cu. yds. of material on the north side of the river and on the Kyser and Perry spoil areas. The orange-peel dredge excavated 232 cu. yds. from prism near the highway bridge, spoiling it on the north side.

About 600 cu. yds. of rock were broken for excavation east of St. Johnsville bridge by the Lobnitz breaker. At Otsquaga creek, about 654 cu. yds. of material were excavated and 364 cu. yds. of paving and 350 cu. yds. of riprap laid.

Contract No. 20-A.—For dredging Mohawk river channel, etc., between Castle creek and upper miter wall of lock at Little Falls.

The orange-peel bucket machine continued excavating in Castle creek, including removal of feeder culvert. A small amount of material was placed in embankment on the north side, the remainder being spoiled in rear of adjacent embankment. Wash wall excavation on both sides was graded to lines. The dredge *Indian Castle* continued excavating in river, about 1½ miles east of the Suspension bridge. Some of the material was excavated, temporarily deposited and rehandled to the Garlock bank. Hard material curtailed the yardage. On August 16 the dredge moved downstream operating near where the land line enters the river, depositing material on the Uhle bank on south side.

Additional wash wall was laid on both sides, the stone being brought from Little Falls.

The Lidgerwood excavator and the tower were dismantled and shipped away.

Quantities: Excavation, 20,836 cu. yds.; wash wall, 1,108 cu. yds.; embankment, 272 cu. yds.

Contract No. 31.— For improving the Erie canal at Little Falls, constructing Lock No. 17, and modifying the dam and constructing guard-gates at Rocky Rift.

Prism excavation in the quarry was completed, except a few high spots. Most of the stone were broken to riprap size and shipped to Contract No. 20-A for wash wall. The spoil pile on Southern avenue was cleaned up and the bank trimmed east of the Adirondack mill. At the storehouse at Rocky Rift dam, material was borrowed to complete the embankment and stone were removed from the dam abutment for the stairway. On north side opposite Adirondack mill stone from storage piles were crushed and shipped from the contract.

Gravel lining was placed on the roadway from the upper cut-off of the north lock wall westerly for about 600 feet and also behind retaining wall No. 2. At Hansen avenue bridge the southeast approach and the sidewalks on the southwest approach were lined.

At Rocky Rift dam about 1,600 ft. B. M. of sawed lumber were used in flash and running-boards. Both concrete stairways were built, counterweights were rubbed, etc. Eighteen additional steel bents were placed, completing the dam. The coffer was removed and the work completed.

The fourth-class riprap on the spoil slope was completed. Considerable work was required to trim this bank to lines. Wrought-iron pipe railing was completed on the dry wall coping along Southern avenue between the guard-gates and Hansen avenue.

The land line at Little Falls is practically complete. At Hansen avenue the bridge approaches are completed for traffic and fences repaired and painted.

Repairs to concrete at lock and retaining wall No. 2 have progressed. The roadway to the Adirondack mill on the river side of the spoil slope has been partly regraded. The rock nose on north side of the roadway was drilled but not removed. Considerable plant was shipped from the contract.

Quantities: Excavation, 1,717 cu. yds.; embankment, 163 cu. yds.; lining, 592 cu. yds.; riprap, 967 cu. yds.; structural steel, 3,715 lbs.; reinforcement, 1,271 lbs.; pipe-railing, 133 lin. ft.

Contract No. 30.— For dredging channel in Mohawk river and land line from Little Falls to Sterling creek, constructing Lock No. 18 at Jacksonburg, Dam No. 14 and guard-gates at Herkimer, retaining dam at Frankfort, bridges, etc.

From Little Falls to Jacksonburg: Rock drilling continued, with an average of 12 drills in operation. The Marion shovel has been in operation since August 5. A second steam-shovel and a stiff-leg traveling derrick are being installed. About 7,038 cu. yds. of rock have been removed to storage piles and loaded on boats, for use in wash wall and riprap at other points on the contract. The dredge *General Herkimer,* on triple shifts, continued river prism excavation, removing 35,368 cu. yds. of material to spoil on the Sharp and Eysaman properties.

At Lock No. 18: Hand-railings were placed on the lock-gates and concrete covers on anchorage recesses. Isolated snubbing-

posts were placed behind the lower guide wall and south lock wall. The storehouse is complete, except the steel doors.

From Lock No. 18 to Ft. Herkimer: The derrick has completed forming south embankment and will be used for unloading wash wall stone. Tower No. 5 grubbed area for north embankment and moving westerly, continued prism excavation. Triple-lap sheeting was driven for a distance of 1,100 feet. Stone for wash wall is being delivered. The Thew shovel excavated canal prism, spoiling material west of Spoon creek. Excavation for wash wall on the north bank progressed, but material was not removed from prism. Wash wall was built and stone for riprap was also delivered.

From guard-gate to dam No. 14, Herkimer: Excavating, pile-driving and placing concrete continued. Two sections were placed under the north abutment of the highway bridge and one pedestal was built. The parapet walls for north approach are complete, except for a length of 40 feet. Foundation piles for two sections at guard-gate were driven.

At Dam No. 14: The southerly portion of the needle-dam and the south abutment were completed, except for a little backfill and the second-class paving. Of the steel work, 6 trestles and the floor panels have been placed and painted. The coffer-dam for the southerly side has been removed and is now being replaced for the northerly portion. The work of raising abutments of the U. & M. V. R. R. bridge progressed.

One mile west of Herkimer: Clearing is being done. The dredge *Dewitt Clinton,* on triple shifts, removed 193,504 cu. yds. of material from prism to spoil on Morgan and Farrington released lands and in river.

At Frankfort bridge: Some triple-lap sheeting has been driven for coffer-dam at south pier.

At East Schuyler bridge: Double shifts were worked at south abutment. The triple-lap sheeting has been driven for the coffer-dam and the latter is about half excavated, material being deposited in the prism. All the piles and second-class concrete have been placed in the east wing, completing it.

Two and one-half miles west of Frankfort: The old river channel has been closed and the water of the Mohawk returned to its natural channel. The derrick sloper worked at filling this channel and on sloping the south bank prism.

Quantities: Excavation, 248,992 cu. yds.; embankment, 3,507 cu. yds.; foundation piles, 2,718 lin. ft.; wooden sheet-piling, 136,158 ft. B. M.; concrete, 985 cu. yds.; wash wall, 785 cu. yds.; riprap, 270 cu. yds.; metal, 12,100 lbs.

Contract No. 29.— For excavating prism from Sterling creek to Oneida-Herkimer county line, constructing lock at Sterling creek, bridges etc.

About 3,376 cu. yds. of material were excavated, of which 195 cu. yds. were from lock and guide walls, 2,369 cu. yds. from Sterling creek and dam, and the remainder from culvert. To this may be added 5,566 cu. yds. excavated but retained from previous months.

About 2,033 cu. yds. of embankment were formed, of which 1,010 cu. yds. were at the culvert, 414 cu. yds. at Sterling creek dam, and the remainder on north side. Some 57,400 ft. B. M. of sheeting and bracing, nearly all new, were used mostly at the culvert. About 2,600 ft. B. M. of wooden sheet-piling were used at Budlong creek. About 532 sq. ft. of steel sheet-piling were used at Lock No. 19, and 785 sq. ft. at Sterling creek dam.

Some 1,284 cu. yds. of second-class concrete were placed, of which 526 cu. yds. were in main and cut-off walls of Lock No. 19 and the remainder in Sterling creek dam. At the lock, 1,220 lbs. of structural steel and 4,081 lbs. of metal reinforcement were also used.

In general, a considerable quantity of stone for wash wall, paving and riprap was hauled from cars at Schuyler siding to points west of Burch culvert. Sheeting was driven for three-fourths of the length of Day's culvert. A large amount of plant has been erected at the culvert. A force of men and teams has been trimming banks east of West Schuyler and Harbor bridges. Sterling creek dam is two-thirds completed. Backfill has been placed and trimmed for Lock No. 19 and some concrete placed around the forebay.

Contract No. 42.— For prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillway, stream entrances, culverts, etc.

Contract canceled. Final estimates being prepared.

Contract No. 43.— For constructing the canal from a point just south of Oriskany road to about 1,500 feet west of Mud creek.

Some clearing was done. The cableway removed 44,137 cu. yds. and the dredge *Stanwix* 90,464 cu. yds. of material from prism. Teams and scrapers grubbed 4,227 cu. yds.

At Nine-Mile creek sluiceway, 972 ft. B. M. of sheeting and bracing, 2,232 ft. B. M. of wooden sheet-piling and 1,080 lin. ft. of foundation piles were used. About 99 cu. yds. of second-class concrete were placed.

At Mill street bridge, 21 cu. yds. of reinforced concrete were placed. Some 2,280 lbs. of reinforcement and 21,040 ft. B. M. of creosoted lumber were also used. About 100 sq. yds. of wood block paving were laid in sidewalk.

Contract No. 44.— For constructing the canal from about 1,500 feet west of Mud creek, west of Rome, to about three miles west of New London, including junction lock, Locks Nos. 21 and 22, bridges, culverts, spillways, stream entrances, etc.

About 80,138 cu. yds. were excavated. From the prism, shovel No. 1347 removed 16,922 cu. yds., shovel No. 841, 27,245 cu. yds. and tower scraper No. 2, 19,081 cu. yds. Shovel No. 883 did no work.

A derrick and teams at lower south approach wall of Lock No. 21 removed 369 cu. yds. Tower scraper No. 1 at Lock No. 22 excavated 3,306 cu. yds. Teams and scrapers excavated 13,215 cu. yds., 2,747 cu. yds. being from south ditch, 179 cu. yds. from its entrance, 393 cu. yds. from north ditch, and 9,896 cu. yds. being excavation of spoil at Lock No. 21.

At Lock No. 21, 7,875 ft. B. M. of sheeting and bracing were reused in lower south approach wall. Some 987 lin. ft. of foundation piles and 17,568 ft. B. M. of wooden sheet-piling were also used at the lock.

At Locks Nos. 21 and 22, 4,099 lbs. of structural steel and 3,867 cu. yds. of second-class concrete, with 3,402 lbs. of reinforcement, were used. Some 59,629 lbs. of metal were placed in lock-gates during the month.

Contract No. 12.— For excavating prism between Oneida lake and Mosquito Point bridge on Seneca river; constructing Lock No. 23 and other structures.

The ladder-dredge No. 2 removed about 11,000 cu. yds. Dipper-dredge No. 4 took out 8,000 cu. yds. and moved to the D. L. & W. R. R. bridge. Dipper-dredge No. 6 cut through Oak

Orchard dam, removing about 6,000 cu. yds. and dredge No. 7 excavated about 20,000 cu. yds.

At Lock No. 23, some 1,500 cu. yds. of concrete were laid in approach walls and invert, quoin-plates and buffer-beams were set and gates are being assembled.

On the western part of the contract, drill-boat No. 2 operated on hard material in prism in the vicinity of Hickory island. Work was also done on dikes.

Contract No. 101.— For the construction of a steel highway bridge superstructure at Three River Point.

Plant is being assembled and material delivered. Work with scrapers began on the north approach, excavating and placing in embankment about 2,592 cu. yds.

Contract No. 57.— For constructing the canal through Onondaga lake outlet.

Recently awarded. Work not yet begun.

Contract No. 22.— Bridges on Contract No. 12.

At Bonta's bridge, concrete pier No. 1 is finished, and the middle span of the superstructure is assembled and bolted. Steel sheet-piling is being driven for coffer-dam at south embankment.

At Free bridge, the new south abutment was completed, and about 160 cu. yds. of embankment were placed in the south approach. The coffer-dam at the pier is ready for the earth fill, all the sheet-piling having been driven.

Contract No. 22-A.— For constructing a new substructure, approach spans and approaches for a bridge over the Erie canal at Weedsport.

Recently awarded. Work not yet begun.

Contract No. 46.— For the construction of the canal from Fox Ridge to the southeast corner of the town of Galen, including Lock No. 25, a movable dam at May's Point, bridges, etc.

At Lock No. 25, 10,845 lin. ft. of foundation piles were driven for the southwest approach walls and the concrete footing was commenced on August 29. About 13,015 sq. ft. of first-class sheet-piling were driven in the north and south sides of the lock. At the south abutment of the movable dam, the defective concrete was removed and 93 cu. yds. of new concrete placed.

Contract No. 47.— For the construction of the canal from the southeast corner of the town of Galen to a point near the N. Y. C. & H. R. railway crossing at Lyons, including Lock No. 26, a dam across the Clyde river, highway bridge, stream entrance, etc.

Work on this contract was concentrated on Lock No. 26 and the dam. The latter was completed by placing 1,772 cu. yds. of second-class concrete. About 2,364 cu. yds. of embankment were formed at the upper approach of the lock, which practically finishes this work. Excavation and protection of abutments are the only uncompleted items on this contract.

Contract No. 5-A.— For the completion of Contract No. 5, from Mosquito Point to Campbell's bridge, including construction of Owasco creek entrance, reconstruction of bridge at Mosquito Point and new pier and approaches at Howland island bridge, etc.

At Mosquito Point bridge excavating for riprap in front of south abutment was completed and riprap placed. Some 3,323 sq. ft. of steel sheet-piling were driven. Excavating for north abutment was also completed.

At Howland island bridge excavating for north pier foundation was completed.

Hydraulic dredge No. 1 continued excavating soft material from prism along the western part of the contract, being followed by dipper-dredge No. 5, which cleaned up the hard material and made grade. These dredges excavated 72,560 cu. yds. of material during the month.

Contract No. 89.— For the construction of five superstructures and one substructure for highway bridges between Lyons and Palmyra, on Contracts Nos. 48, 76 and 77.

Contract work not yet begun.

Contract No. 48.— For the construction of the canal from a point near the N. Y. C. & H. R. railway crossing at Lyons to a point near the West Shore railway crossing at East Newark, including Locks Nos. 27 and 28-A, dam and power-house, retention dam across Canandaigua outlet, spillway, culverts, highway, bridge, approaches, etc.

The dipper-dredge continued loosening hard material in prism. The total excavation was 88,972 cu. yds., of which the hydraulic dredge *Lyons* removed 63,000 cu. yds. at east end of contract, the Browning crane 15,100 cu. yds. west of the N. Y. C. R. R. bridge,

and the Marion shovel, 1,500 cu. yds. The balance of the excavation was at structures. The Marion shovel was removed from the prism on August 5.

At Geneva street bridge, the steelwork was erected and riveting nearly completed.

At Lock No. 27, 11,700 sq. ft. of steel sheet-piling were driven and 282 cu. yds. of second-class concrete placed.

At Lock No. 28-A, 2,268 cu. yds. of second-class concrete were placed in south wall, which is nearly completed.

On the Hill parcel, 23,800 ft. B. M. of wooden sheet-piling were driven, completing this item.

At the Poorhouse bridge, the floor was laid, 1,400 lin. ft. of fence built and some lining placed on the north approach.

At the blue cut, 60 cu. yds. of wash wall, and 256 sq. yds. of second-class stone paving were laid and 60 cu. yds. of lining and 165 cu. yds. of puddle placed.

Contract No. 76.— For the construction of the canal from a point near the West Shore railway crossing at East Newark to a point about one-half mile east of Port Gibson.

At Lock No. 28-B, steelwork was painted, fenders and buffer-blocks placed and pumping done.

At Newark dock, a locomotive crane excavated 930 cu. yds. and 1,050 cu. yds. of second-class concrete were placed in wall.

At East avenue bridge, 1,080 cu. yds. of second-class concrete were placed in abutments.

Grading highway at west end and draining cellars on West Union street continued.

Contract No. 77.— For constructing the canal from one-half mile east of Port Gibson to one-half mile west of Palmyra, including Lock No. 29, power-plant, bridges, culverts, etc.

At Port Gibson bridge substructure, 147 cu. yds. were excavated, 720 cu. yds. of second-class concrete laid and 4,186 lin. ft. of foundation piles driven in abutments. Also, 127 cu. yds. were excavated and 80 cu. yds. of reinforced concrete were laid in the highway culvert. About 231 cu. yds. were excavated and 37 cu. yds. of reinforced concrete placed in the highway culvert at Galloway's. The suction dredge *Palmyra,* working in the big cut, removed 44,427 cu. yds. from prism. Shovel No. 20, working in prism below Lock No. 29, excavated 13,356 cu. yds. The approaches to the bridge at Railroad avenue and Limerick street

are nearly complete. At the spillway, 97 cu. yds. of lining were placed.

At Lock No. 29, 194 cu. yds. of second-class concrete were placed in the lock proper and 332 cu. yds. in the power-house. About 3,400 lin. ft. of foundation piles were driven at the site of the power-house. Work continues on the buffer-beams and gates for the lock.

Some 1,008 cu. yds. of wash wall were built. The erection of Railroad avenue bridge superstructure is under way.

Contract No. 49.— For prism construction from a point about 500 ft. east of Yellow Mills bridge, about one mile west of Palmyra, to the Monroe county line, including Lock No. 30, sluice-gates, highway bridges, culverts, etc.

At Lock No. 30 and vicinity, the traveler excavated 9,763 cu. yds. from prism and upper approach. About 1,446 cu. yds. of second-class concrete were placed in the lock, 172 cu. yds. in the lower approach and 2 cu. yds. in the bridge below. About 67 cu. yds. of reinforced concrete were also placed at bridge. Work on steel construction at the lock continued.

At Frear's bridge, the south approach is nearly completed with material taken from borrow-pit.

Miscellaneous work on the different bridges continued.

Quantities: Excavation, 12,181 cu. yds.; embankment, 3,945 cu. yds.; dry stonework, 526 cu. yds.; sawed lumber, 14,000 ft. B. M.; foundation piles, 653 lin. ft.

Contract No. 63.— For enlarging present canal and constructing culverts, sluiceways, waste-weir, guard-gates, dock walls, bridges, highway changes, etc., between Wayne-Monroe county line and Kings Bend.

The dredge *Fairport* continued prism excavation, working westerly to Cobb's bridge, spoiling material adjacent. The Lidgerwood excavator worked about half of the time on the north slope of prism just west of Cobb's bridge, casting material into adjacent embankment and spoil. Other excavation by a team outfit was in trimming new channel for Thomas creek, at approaches to Parker street, Monroe avenue, and Knapp's bridges and in building embankment under the R. S. & E. R. R. bridge. Steam-shovel No. 1865, at the west end of the contract, excavated prism between old and new south banks, placing material in south embankment and on Kaiser spoil bank.

Lining was placed on tow-path in various places and on approaches to Cartersville, State street, Mitchell's, Main street, Pittsford and Cobb's bridges. Coping stone were laid on wash wall in considerable quantities.

In concrete work, the abutments and slabs of Monroe avenue bridge and the lining of the old stone arch of culvert No. 30 were completed. The new north extension of this culvert is under way. Placing fourth-class riprap on the south slope of Cartersville embankment has been completed as far as present conditions permit. The temporary guard-gate at the west end of Irondequoit trough has been removed.

Quantities: Excavation, 47,342 cu. yds.; embankment, 30,111 cu. yds.; lining, 1,760 cu. yds.; wash wall, 71 cu. yds.; concrete, 100 cu. yds.; wood fencing, 1,654 lin. ft.; sawed lumber, 13,500 ft. B. M.

Contract No. 23.— For prism excavation between Kings Bend and Genesee river, and construction of Locks Nos. 32 and 33, guard-lock, bridges, culverts, etc.

Pumping for drainage continued at Locks Nos. 32 and 33.

Steam-shovels Nos. 2449 and 1178 continued excavating in prism between East Henrietta and Westfall roads, most of the time cutting on upper benches to flatten side slopes in the deep cut. Material was placed in north and south embankments in the vicinity of South avenue. Steam-shovel No. 667 excavated in prism east of Lock No. 33, up to August 8, sending its output to south embankment and spoil just west of the lock. Shovel No. 938 began excavating in prism at wide waters west of Lock No. 33, sending its output either to north dike west of Lock No. 32 or to spoil back of its north wall.

Other excavation was by hand at the lower guide wall of Lock No. 32, for riprap at north end of Allen creek culvert and at forebays and by-pass culvert entrances at upper ends of both locks. A team outfit excavated in the by-pass channel at Lock No. 33.

Considerable sheeting and bracing were used at the south abutment of West Henrietta road bridge, and round piles were driven at both abutments.

Second-class concrete was placed in the upper guide wall of Lock No. 33, and lower guide wall, lower spillway and for setting snubbing-posts at Lock No. 32.

The north wall and bridge skew-back at West Henrietta road were completed. Riprap was placed at forebays and at by-pass culvert entrances at both locks; also at the north end of Allen creek culvert. Wash wall protection was placed on the south side of by-pass channel of Lock No. 33 and on south prism slopes just west of the lock.

Cast-iron outlet-pipes of by-pass and most of the snubbing-posts for the lock and upper guide walls were placed in position at Lock No. 32. Plank floors were laid at South and Clinton avenue bridges.

Quantities: Excavation, 72,203 cu. yds.; embankment, 64,567 cu. yds.; sheeting and bracing, 13,700 ft. B. M.; sawed lumber, 18,200 ft. B. M.; foundation piles, 1,083 lin. ft.; concrete, 1,566 cu. yds.; riprap, 222 cu. yds.; cast-iron pipe, 22,570 lbs.; iron castings, 5,036 lbs.

Contract No. 21.— For prism excavation and construction of bridge abutments, guard-lock, etc., from the Genesee river west 2.56 miles to a point just west of the N. Y. C. & H. R. railway crossing.

Pumping for drainage continued at five places for the entire month.

Shovel No. 3 continued excavating in the rock cut and No. 4 in the earth cut, west of the B. R. & P. R. R. The locomotive crane was used to excavate the site of the B. R. & P. R. R. bridge.

At the guard-lock, placing concrete continued. The stone used, were crushed at the site. From 9 to 11 steam-drills continued operating ahead of the shovel in the rock cut. From 3 to 5 channelers cut prism lines in the rock section. At the B. R. & P. R. R. bridge, the addition to the south abutment is completed, and the plant moved to north side.

Quantities: Excavation, 52,593 cu. yds.; concrete, 387 cu. yds.; channeling, 6,605 sq. ft.

Contract No. 82.— For furnishing and erecting three steel highway bridge superstructures on Contract No. 21, near Rochester.

No contract work was done.

Contract No. 75.— For construction of three guard-gate superstructures on Contracts Nos. 60, 61 and 64.

The guard-gates at Spencerport and Brockport have been completed under the original contract, but some work remains to be done under an extra work order.

Contract No. 105.— For the construction of five lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Union street, Spencerport; Washington street, Adams Basin; Park avenue, Brockport; Hulberton; Gasport.

At Washington street bridge, Adam's Basin, both abutments were completed, ready for steelwork. Concrete for operator's cabin on north side was also placed. The concrete plant, sheeting and bracing, and piling have been removed to Hulberton.

Plant for steel erection is ready for assembling superstructure.

At Park avenue bridge, Brockport, a stratum of quicksand was encountered in excavating the north pit. This proved so unreliable that it was necessary to construct a line of triple-lap sheet and steel sheet-piling, backed up with an earthen dike, to hold back the water from the canal. After this was completed the north pit was excavated to grade and concrete foundation placed. Forms for side walls are under way.

At Hulberton lift-bridge, a derrick was placed and plant prepared to begin work.

Quantities: Excavation, 934 cu. yds.; embankment, 370 cu. yds.; concrete, 349 cu. yds.; iron and steel, 13,761 lbs.

Contract No. 60.— For prism excavation and construction of culverts, bridge structures, etc., between a point 1.75 miles east of South Greece and a point 0.5 mile west of Adams Basin.

The ladder-dredge *Mohawk* continued cleaning the bottom of the prism, most of the time between bridges Nos. 95 and 96, either spoiling material or placing in adjacent embankment. The derrick-scow and crane also continued excavating in prism or in spoil for material to form embankment on south approach of bridge No. 102. Other excavation was by hand for wash wall, trimming spoil banks and clearing tow-path after dredge operations. Placing puddle from the scow also continued during the entire month. Wash wall was laid at various places and some ditching for drainage was done. Repairs were made to bridges Nos. 95, 99 and 100.

Quantities: Excavation, 3,884 cu. yds.; embankment 1,830 cu. yds.; puddle, 697 cu. yds.; wash wall, 344 cu. yds.

Contract No. 61.— For prism excavation and construction of culverts, bridges, waste-weir, etc., between a point 0.5 mile west of Adams Basin and Monroe-Orleans county line.

Excavator No. 1 continued removal of old berme bank east of the guard-gate, material being transported by scows to embankment on south side east of Park avenue. Excavator No. 2 operated during the latter half of the month, cutting material from the north bank which was also sent by scows to south embankment east of Park avenue. Excavator No. 3 was not at work. Other excavation was by hand for wash wall, paving drainage ditches, trimming banks, and for the Clinton street retaining wall.

Construction of wash wall was continued at various places and some paving was done at bridge No. 109. Concrete was placed at Clinton street wall during the latter half of the month.

Quantities: Excavation, 15,130 cu. yds.; embankment, 11,918 cu. yds.; lining, 398 cu. yds.; concrete, 409 cu. yds.; wash wall, 3,756 cu. yds.; third-class paving, 124 cu. yds.

Contract No. 62.— For prism excavation and construction of culverts, bridge substructures, etc., between Orleans-Monroe county line and a point near Eagle Harbor bridge.

Albion section:

About 29,700 cu. yds. of material were excavated by the Bucyrus excavator with drag-line on berme east of bridge No. 125, Lidgerwood excavator on berme near Lattin's bridge, from ditch east of Hindsburg bridge, ditch on berme at culvert No. 82, ditch on berme east of Gaines bridge, culvert under north approach of bridge No. 125 and for wash wall notch at various points.

About 3,400 cu. yds. of embankment were formed by the excavators and by teams east of Gaines bridge. Some 5,400 cu. yds. of wash wall were built at various points.

About 116 cu. yds. of concrete were placed at culverts Nos. 74 and 76, and at culverts under south approach of Gaines bridge and north approach of Brailey's bridge. About 163,000 lbs. of structural steel were placed at bridges Nos. 123 and 130, and 7,524 lbs. of metal reinforcement were used at bridges Nos. 120, 121, 130 and road culvert. Backfilling was placed on north side at Albion vertical wall.

Holley section:

About 8,800 cu. yds. of material were excavated by men and teams in ditch at culvert No. 68, from borrow-pits at McCarthy's and Hurlberton bridges, berme side, and wash wall notch at various points.

About 13,602 cu. yds. of embankment were formed, on tow-path west of McCarthy's bridge, on berme east of Tuttle's bridge, on tow-path west of Hulberton bridge, and tow-path west of culvert No. 70. Some 3,400 cu. yds. of wash wall were built at various points. At Holley lift-bridge some 5,600 lbs. of machinery were placed. Paving stones were cut. Gravel was unloaded at Holley trough.

Contract No. 64.— For improvement from 600 ft. west of Prospect street, Medina, to 100 ft. east of Gasport bridge.

About 27,000 cu. yds. of material were excavated. The dipper-dredge *Empire* worked west of Maybee's bridge and the dipper-dredge *Peconic* east of the bridge. Notch for wash wall was also excavated and grubbing done at various points. The dredge *Empire* placed about 3,500 cu. yds. of first-class embankment. Some 860 cu. yds. of lining were placed and 1,300 cu. yds. of wash wall built. Repairs were made to dredges.

Contract No. 66.— For prism excavation and constructing bridges and approaches, culverts, etc., from 100 ft. east of Gasport bridge to 600 ft. east of Lockport locks.

About 1,139 cu. yds. of material were excavated, of which a clam-shell at Orangeport removed 832 cu. yds. of earth from prism, spoiling it on berme.

At Lake avenue bridge some 307 cu. yds. were excavated for drain, and 994 cu. yds. of second-class embankment placed behind approach wall. Some 134 cu. yds. of second-class and 9 cu. yds. of reinforced concrete were placed in the bridge approach, practically completing it. About 17 cu. yds. of lining, 96 sq. yds. of third-class paving and 2,537 lbs. of cast-iron culvert pipe were also placed. Some 223 lin. ft. of wood fencing were also built.

Contract No. 67.— For construction of Locks Nos. 34 and 35 and approaches, etc., at Lockport.

About 3,402 cu. yds. were removed by hand labor of which 3,095 cu. yds. were taken from Locks Nos. 34 and 35, and 307 cu. yds. from site of north abutment of Main street bridge.

About 7,956 cu. yds. of second-class concrete were placed. Of this, 2,812 cu. yds. were placed at Lock No. 34, using a one-yard mixer; 4,999 cu. yds. were placed in Lock No. 35, using a two-yard mixer; 145 cu. yds. were placed in the north abutment of Main street bridge.

About 51 lin. ft. of 6-in., 258 lin. ft. of 12-in. and 178 lin. ft. of 15-in. vitrified pipe were laid.

In Locks Nos. 34 and 35, 5,297 lbs. of metal reinforcement, 1,283 lbs. of structural steel, 11,085 lbs. of plain castings and 6,080 lbs. of machined castings were placed.

Some 560 lin. ft. of bolt-holes were drilled in rock and 317 lin. ft. of fiber ducts were laid.

Contract No. 40.— For constructing the canal, culvert entrances, guard-gates, stream entrances, bridges, etc., from the Lockport locks to Sulphur Springs guard-lock.

At Summit street bridge, 8 cu. yds. of embankment were formed, 121 cu. yds. of lining placed, and 116 lin. ft. of wood fencing built.

At Prospect street bridge, 119 cu. yds. of material were excavated and 75 cu. yds. of second-class concrete placed in piers and abutments.

At Riley's bridge, 62 cu. yds. of lining were placed.

At Hawley's bridge, 37 cu. yds. of second-class concrete were placed in piers and abutments.

About 36 cu. yds. of reinforced concrete, using 35 lbs. of reinforcement, were placed in bridge walks at Prospect street, Summit street and Hawley's bridges.

Some 14,239 lbs. of metal were used in the guard-gate.

Contract No. 19.— For prism excavation, rebuilding bridges, constructing masonry culvert, concrete-capped pile docking, etc., between Sulphur Spring guard-lock and mouth of Ellicott creek.

The hydraulic dredge *Niagara* removed 29,069 cu. yds. of material at Tonawanda and Six-Mile bend, working double shifts.

The dipper-dredge *Buffalo* on triple shifts excavated about 18,000 cu. yds. of material which were spoiled in prism, to be rehandled later by the hydraulic dredge.

About 34,800 ft. B. M. of triple-lap sheet-piling were driven at stream entrances. The work of placing ties and backfill at Martinsville dock was continued.

Champlain Canal.

Contract No. 70.— For dredging a channel in the Hudson river from outlet of Barge canal at Waterford to Lock No. 1.

Contract canceled by order of the Canal Board, July 18, 1912.

Contract No. 71.— For constructing Lock No. 1 and Dam No. 1, above Waterford, and dredging Hudson river from Lock No. 1 to lower Mechanicville lock.

Contract canceled by order of the Canal Board, August 8, 1912.

Contract No. 69.— For constructing Lock No. 2, at lower Mechanicville.

The sheeting for crib at upper guide-wall was driven and the mud removed by a 6-in. sand-pump.

Excavation in the lower prism has stopped until the lower gates are swung when the remaining material will be excavated and the coffer-dam removed. Material excavated has been spoiled in north bridge approach. Quoin and toe-posts on lower gates are bolted in place and fenders are being framed. The concrete plant for finishing work in the upper level is complete and concrete is now being laid.

Contract No. 72.— For dredging Hudson river from lower Mechanicville to Stillwater.

Contract canceled by order of the Canal Board, July 18, 1912.

Contract No. 88.— For the construction of a steel highway bridge at Schuylerville, within the limits of Contract No. 73.

The sheet-piling for the west pier was completed. About 65 piles were placed and triple-lap sheet-piling was driven on all four sides. Concreting is now in progress.

Quantities: Excavation, 136 cu. yds.; concrete, 221 cu. yds.

Contract No. 1.— For dredging Hudson river from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; constructing Crocker's Reef dam and approaches to "Land Line," etc.

Work closed down indefinitely.

Contract No. 24.— For constructing guard-gate at Crocker's Reef.

Excavating was done and forms for lower approach to guard-gate were erected for a length of 180 feet. About 492 cu. yds. of concrete were placed. About 600 cu. yds. of wash wall were placed on the slope south of the guard-gate. Excavation of rock has progressed on the east slope north of the guard-gate and for the foundation of the sluice-gate.

Quantities: Excavation, 1,191 cu. yds.; embankment, 210 cu. yds.

Contract No. 54.— For constructing Lock No. 7, at Fort Edward.

About 2,100 cu. yds. were excavated from prism at north end of contract and spoiled adjacent to upper east approach wall. About 3,319 cu. yds. of second-class concrete were placed, completing the south half of lock walls, except one section. The riveting of the lower lock-gates was finished and the first field coat of paint applied. The upper miter-sills were set and grouted. The upper buffer-beam received its second field coat of paint.

Contract No. 27-A.— For completing the construction of the canal between the Hudson river at Fort Edward and the south end of Contract No. 25, at Dunhams Basin road.

About 18,471 cu. yds. were excavated from spoil banks on west side. Other excavation amounted to 6,445 cu. yds., of which 109 cu. yds. were from cut-off wall at Lock No. 8, 4,331 cu. yds. from prism near Argyle street, 170 cu. yds. from northwest approach wall of Lock No. 7, 1,419 cu. yds. from ditches on east side, etc.

About 3,980 cu. yds. of embankment were formed, of which 150 cu. yds. were back of west wall of Lock No. 8, 615 cu. yds. back of northwest approach wall and the balance on west side of prism, about one mile north of the lock.

About 1,520 ft. B. M. of sheeting and bracing were used at the cut-off wall of Lock No. 8 and the northwest approach of Lock No. 7. About 957 cu. yds. of second-class concrete were placed, of which 190 cu. yds. completed the cut-off wall and 89 cu. yds. the power-plant at Lock No. 8, the balance being place in the approach wall of Lock No. 7. Some 15 cu. yds. of reinforced concrete were also placed in the power-plant. About 1,915 cu. yds. of wash wall were built at various points, mostly on the west side. Some 2,725 lbs. of metal reinforcement were used at Lock No. 8, and power-plant.

Contract No. 25.— For prism excavation between a point 0.6 mile north of Comstock post-office and highway crossing at Dunhams Basin; constructing Lock No. 9, spillways, power-plant, etc.

The dredge *Champlain* and the dipper and orange-peel dredges

between Fort Ann and Comstock excavated 42,994 cu. yds.; 417 cu. yds. were removed at the east abutment of Comstock bridge and 34 cu. yds. for snubbing-posts at southeast approach of Lock No. 9.

Some 538 cu. yds. of lining were placed on approach to Henry's bridge. About 34 cu. yds. of concrete and 1,943 lbs. of iron castings were placed in snubbing-posts. About 3,382 cu. yds. of wash wall were built between Henry's bridge and Dunhams Basin. Some 402 lin. ft. of wooden fence were built at Smiths Basin bridge.

Oswego Canal.

Contract No. 39.— For dredging channel in Oswego river, constructing stream entrances, excavating through Hinmansville cut-off, etc., between Three River Point and Fulton, except portion covered by Contract No. 53.

No contract work was done.

Contract No. 85.— For constructing a steel bridge over the lock at Phoenix.

No contract work was done.

Contract No. 80.— For constructing a concrete dam across the Oswego river at Phoenix.

No contract work was done.

Contract No. 104.— For the construction of a reinforced concrete arch bridge over the Barge canal at Broadway, Fulton.

Excavating for east abutment continued, 251 cu. yds. of material being removed.

Contract No. 10-A.— For completing the construction of the canal, raising the upper dam, etc., from Broadway bridge, Fulton, south to Contract No. 39.

About 775 cu. yds. of material were excavated, of which 415 cu. yds. were from prism and the remainder for wash wall at Yelverton island. About 771 cu. yds. of embankment were formed, of which 152 cu. yds. were in dike at Yelverton island and the remainder on the east side.

Some 3,457 ft. B. M. of spruce lumber were used in floating fenders. About 385 cu. yds. of first-class concrete were laid at the upper dam. About 580 cu. yds. of wash wall were built, of which 521 cu. yds. were on the east side and 59 cu. yds. in the

dike at Yelverton island. About 1,319 lbs. of structural steel were used, most of it in dowels in the upper dam. For the fenders 396 lbs. of ⅝-in. log chain were used.

Contract No. 10-B.— For completing the construction of the canal from the upper end of Lock No. 2, Fulton, north to Contract No. 37.

At Lock No. 3, 9,910 cu. yds. were excavated, 295 sq. ft. of rock channeled and about 3,615 sq. ft. of rock surface cut by line drilling as a substitute for the channeler. Below the lock 270 cu. yds. were removed.

At Lock No. 2, 200 cu. yds. of embankment were formed. About 93 cu. yds. of concrete and 2,180 lbs. of reinforcement were placed in the tail-race of the power-plant.

Contract No. 37.— For dredging a channel in Oswego river, constructing Locks Nos. 5 and 6, dams, bulkheads and other structures, and the removal of Battle Island and High dams, between Contract No. 10, at Fulton, and Contract No. 35, at Oswego.

About one acre was cleared on the west shore of the river.

About 29,328 cu. yds. were excavated, of which 10,212 cu. yds. were from prism between Contract No. 10 and Lock No. 5, 4,503 cu. yds. between Locks Nos. 5 and 6, 2,078 cu. yds. between Lock No. 6 and Contract No. 35, 6,490 cu. yds. from Minetto retaining wall and dike, 1,872 cu. yds. from bulkhead No. 5, 3,473 cu. yds. from Lock No. 5, and 700 cu. yds. from lower guide wall of Lock No. 6.

About 147 lin. ft. of 18-in. tile drain were laid.

On road "B", adjacent, 7,463 cu. yds. were excavated from borrow-pit, 5,918 cu. yds. of embankment were formed and 1,311 cu. yds. of lining were placed.

Contract No. 35.— For prism excavation and constructing Locks Nos. 7 and 8, bulkheads, culverts, spillways, etc., between a point one-half mile above Utica street bridge and harbor line north of Bridge street, at Oswego.

About 5,278 cu. yds. of material were excavated, of which 2,863 cu. yds. were from prism, 1,202 cu. yds. from west wall, 363 cu. yds. from east upper approach of Lock No. 7, 800 cu. yds. from retaining wall west of this lock and 50 cu. yds. from piers above the lock.

In the west wall, 1,556 cu. yds. of concrete, 3,129 lbs. of structural steel, 61 lbs. of reinforcement and 777 lbs. of castings were placed. In the east upper approach to Lock No. 7, 398 cu. yds. of concrete, 1,179 lbs. of reinforcement and 777 lbs of castings were placed. In the piers above Lock No. 7, 254 cu. yds. of concrete, 368 lbs. of structural steel, 895 lbs. of reinforcement and 1,165 lbs. of castings were placed. About 5,641 lbs. of structural steel were also placed in culvert No. 5. At Lock No. 7, 8,738 lbs. of metal were placed in valves and 134,469 lbs. in gates.

Cayuga and Seneca Canal.

Contract A.— For constructing Lock No. 1 and Dam No. 1, near Cayuga.

About 1,400 cu. yds. of concrete were laid in the floor of the lock, completing it. About 50 cu. yds. were placed in the north approach wall.

Backfill along the east wall has been placed for about sixty per cent of the length and the excavator moved to the north approach wall. The miter-sills and buffer-blocks were treated and placed in the lock. About 2,100 lbs. of metal were placed in lock-gates.

At the dam site, foundation was prepared and two piers partly built, requiring about 525 cu. yds. of concrete. Excavating for east abutment is nearly finished. About 1,000 cu. yds. of material were moved to the spoil bank.

Quantities: Excavation, 2,199 cu. yds.; embankment, 1,953 cu. yds.; sawed lumber, 32,136 ft. B. M.; piles, 2,875 lin. ft.; iron and steel, 1,512 lbs.

Contract B.— For excavating a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from Cayuga lake to Seneca Falls and from Waterloo to deep water in Seneca lake.

The dredge *Clyde* excavated 153,871 cu. yds. of material from the prism during the month. Dikes were built at spoil areas both north and south of Free bridge. The dike north of the Clyde river was completed.

Contract H.— For excavating a channel in Cayuga lake inlet at Ithaca from a point about 300 feet north of Cascadilla street, to deep water in Cayuga lake.

Contract work not yet begun.

WATER-SUPPLY.

Contract No. 50.— For constructing dam, waste-gates and spillway across West Canada creek at Hinckley.

Excavation for north gate-house and spillway section inside of coffer-dam progressed, on double shifts. An inefficient pumping-plant failed to keep the water down inside the coffer and delayed progress. Material excavated was deposited in the creek above. Embankment was formed on both sides of the core wall. Forms were erected for the spillway section and placing concrete and Cyclopean masonry began. Some third-class riprap was also placed.

Quantities: Excavation, 7,338 cu. yds.; embankment, 9,974 cu. yds.; lining, 100 cu. yds.; concrete, 247 cu. yds.; Cyclopean masonry, 522 cu. yds.; riprap, 420 cu. yds.; reinforcement, 1,300 lbs.; line drilling, 3,451 sq. ft.

Contract No. 51.— For constructing a canal feeder from Trenton Falls on West Canada creek to Nine-Mile creek below South Trenton, with gate-house, culverts, highway, etc.

Browning shovel No. 1 removed 3,400 cu. yds. from feeder prism, near intake, which was spoiled adjacent. Teams with drag-scrapers, working along the side hill, removed about 4,900 cu. yds., the better portion of which was placed in embankment, while unsuitable material was spoiled. In the heavy cut at Cincinnatus creek, excavator "K" cut to grade, removing about 8,500 cu. yds. Two traveling derricks removed about 8,000 cu. yds. Some 1,300 cu. yds. were also removed from drainage ditches and culvert foundations.

The cast-iron pipe for the drainage culvert was laid and surrounding concrete placed. Concrete bridge floors have also been placed.

Quantities: Excavation, 26,133 cu. yds.; sheeting and bracing, 2,962 ft. B. M.; embankment, 1,196 cu. yds.; second-class concrete, 72 cu. yds.; reinforced concrete, 56 cu. yds.; reinforcing metal, 3,986 lbs.; cast-iron pipe and specials, 10,238 lbs.

Contract No. 55.— For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black River canal, with four locks and aqueduct over Mohawk river, highway change, bridges, etc.

Final estimates approved by Canal Board, August 27, 1912.

Contract No. 55-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 55, Delta reservoir, to a new cemetery outside the flow lines.

Contract completed and final estimates being prepared.

POWER-SUPPLY.

Contract No. 91.— For building and equipping a hydro-electric power-plant on the Erie canal near the east end of Crescent dam.

Some 53 cu. yds. of first-class reinforced concrete were placed in walls and cornice of the superstructure, completing it to the roof. Finishing surfaces of walls, removal of coffer-dam and grading on south side of power-house, continued.

Contract No. 90.— For constructing hydro-electric power-plants at Baldwinsville on the Erie canal, and at Smiths, Comstock and Whitehall on the Champlain canal. Also for constructing equipment for operating and lighting the following locks: No. 24, Erie canal; Nos. 1, 2, 7 and 8, Oswego canal; Nos. 9, 11 and 12, Champlain canal.

On the Champlain canal:

At Lock No. 9, cleaning up the lock, packing material for shipment and general work on lock operating machinery progressed.

At Lock No. 11, magnet break coils and terminals were fixed.

At Lock No. 12, oil-guards were set on turbines.

At all of the above locks, under an extra work order, fuses were set in signal lights on panel-boards of gates, valves and capstans.

Contract No. 90-A.— For constructing hydro-electric power-plants, sub-stations and equipments to complete installations at Locks Nos. 1, 2, 7 and 8, Oswego canal.

About 219 cu. yds. of material were excavated and 16 cu. yds. of second-class concrete laid in foundation of power-house at Lock No. 2.

Progress of Plans Being Prepared.

The following pages contain detailed accounts of the plans in process of preparation at the main and residency offices, showing progress up to the first of September. An order according to location is followed, as explained in the acount of contract work for the month.

Erie Canal.

Contract No. 14-A.— For clearing lands along the Mohawk river and removing buildings, from Crescent dam to Rexford Flats. Plans completed.

Contract No. 18-A.— For completing the construction of the canal from Mindenville to Castle creek. Plans 83 per cent completed.

Contract No. 84.— For the construction of two steel lift bridges at Clyde, within the limits of Contract No. 47. Work on plans suspended, pending an investigation as to elimination of grade crossing.

Contract No. 59.— For constructing a movable dam in the Genesee river at Rochester. Plans 90 per cent completed.

Contract No. 106.— For the construction of four lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Exchange street, Lockport; Middleport; Prospect street, Medina; Main street, Brockport. Plans 96 per cent completed.

Contract No. 65.— For work from the west end of Contract No. 9, at a point near Beal's bridge, to the east end of Contract No. 64, at a point 600 feet west of Prospect street, Medina, including Oak Orchard creek crossing. Plans 98 per cent completed.

Oswego Canal.

Contract No. 103.— For the construction of a concrete arch bridge over the Oswego river at Phoenix, N. Y., and of a bascule bridge over the Oswego canal at the same point. Revised plans completed.

Contract No. 37-R.— For the removal of bodies from the Minetto cemetery, within the limits of Contract No. 37, to a new cemetery outside the flow line. Plans 95 per cent completed.

Cayuga and Seneca Canal.

The following is the revised arrangement of plans on this canal. Former Contract G is included in new Contract D.

Contract C.— For the construction of Locks Nos. 2 and 3, Dam No. 2, retaining walls, bridge abutments and appertaining work at Seneca Falls. Plans 50 per cent completed.

Contract D.— For excavation of canal prism from a point one-half mile east of Demont's bridge to the west line of Waterloo village at Contract B. Plans 70 per cent completed.

Contract E.— For the construction of Lock No. 4, regulating works, guard-gate and appertaining structures at Waterloo. Plans 50 per cent completed.

Contract F.— For constructing Lock No. 5 and dam at Waterloo. Plans 55 per cent completed.

Contract J.— For improving Glen creek from the highway bridge in the village of Watkins to the canal improvement. Plans under way.

POWER-SUPPLY.

Contract No. 94.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 26 to 35, inclusive, on the Erie canal. Plans 50 per cent completed.

Plans before Canal Board.

Contract No. 74.— For dredging Mohawk river from Hudson river to Contract No. 2-E. Plans approved by the Canal Board August 27, 1912.

Contract No. 92.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 2 to 19, inclusive, on the Erie canal, and Locks Nos. 1 to 8, inclusive, on the Champlain canal. Plans completed.

Contracts Advertised.

Contract No. 70-A.— For the completion of the work remaining to be done on Contract No. 70. Advertised; bids to be opened September 24, 1912.

Contract No. 71-A.—For the completion of the work remaining to be done on Contract No. 71. Advertised; bids to be opened on September 24, 1912.

Contract No. 72-A.— For the completion of the work remaining to be done on Contract No. 72. Advertised; bids to be opened September 24, 1912.

Contract No. 56.— Glens Falls feeder. Advertised; bids to be opened September 24, 1912.

Award of Contract.

Contract I.— For improving the canal from deep water in Seneca lake to Montour Falls, about 2.75 miles. Bids opened September 4, 1912. Five bids were received, the lowest of which was by the Central Dredging Co., 542 Rockefeller Building, Cleveland, O., to whom it was subsequently awarded at $215,639.

Recapitulation — Progress on Plans.

Contract No.	DESCRIPTION.	Canal.	Progress on plans.
14A	Clearing lands on Contract 14	Erie	Plans completed.
18A	Mindenville to Castle creek	Erie	83 per cent completed.
37R	Removal of bodies at Minetto	Oswego	95 per cent completed.
56	Glens Falls feeder	Champlain	Advertised.
59	Rochester harbor dam	Erie	90 per cent completed.
65	Canal and aqueduct at Medina	Erie	98 per cent completed.
70A	Supplemental to Contract 70	Champlain	Advertised.
71A	Supplemental to Contract 71	Champlain	Advertised.
72A	Supplemental to Contract 72	Champlain	Advertised.
74	Dredging Hudson river to Contract 2-E	Erie	Approved by Canal Board.
84	Two lift-bridges at Clyde	Erie	Suspended.
92	Power-house and lock equipments	Erie, Champlain	Completed.
103	Bridge at Phoenix	Oswego	Completed.
106	Bridges on Contracts 61, 64, 65 and 67	Erie	96 per cent completed.
C	Locks 2 and 3, Dam 2, etc., at Seneca Falls	Cayuga and Seneca	50 per cent completed.
D	Dredging, Demont's bridge to Waterloo	Cayuga and Seneca	70 per cent completed.
E	Lock 4, guard-gate, etc., at Waterloo	Cayuga and Seneca	50 per cent completed.
F	Lock 5 and dam at Waterloo	Cayuga and Seneca	55 per cent completed.
I	Watkins to Montour Falls	Cayuga and Seneca	Awarded.
J	Glen creek at Watkins	Cayuga and Seneca	Under way.

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THE STATE ENGINEER AND SURVEYOR

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STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
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CONTENTS

Progress of Contract Work..... 302
Brief Account of Contract Work for September..... 303
Progress of Plans Being Prepared..... 328
Plans before Canal Board..... 329
Contracts Advertised..... 329
Bids Opened..... 330
Award of Contract..... 330
Bids for Contract I..... 331
Bids for Contract No. 56..... 332

Progress of Contract Work.

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Oct. 1, 1912.
		Put under contract.*	Done to Oct. 1, 1912.	Done during Sept., 1912.	
1	Empire Engineering Corporation	$580,424	$474,400	0	81.8
2	Ferguson Contracting Company *a*	990,076	694,390	0	70.1
2E	Holler & Shepard *b*	(307,023)	274,610	$8,280	89.5
3	Sundstrom & Stratton	657,273	633,290	0	Finished.
4	Empire Engineering Corporation	726,780	720,073	0	Finished.
4B	E. J. Doyle & Company	1,351	1,332	0	Finished.
5	Empire Engineering Corporation *a*	156,941	125,820	0	80.2
5A	James Stewart & Company *b*	(317,597)	239,990	42,440	75.5
6	F. A. Maselli	1,026,550	1,033,864	0	Finished.
7	Groton Bridge Company	101,930	98,929	0	Finished.
8	Pittsburg-Eastern Company *a*	1,516,789	920,420	0	60.7
8A	The Foundation Company *b*	(799,399)	0	0	0.0
9	Thomas Crimmins Contracting Co.	803,297	655,461	0	Finished.
10	McDermott Contracting Company *a*	1,206,019	668,360	0	55.4
10A	The T. A. Gillespie Company *b*	(174,514)	88,600	11,070	50.8
10B	Oswego Construction Co., Inc. *b*	(516,336)	76,240	23,380	14.8
11	Fort Orange Construction Co	1,333,199	1,190,440	4,260	89.3
12	James Stewart & Company	3,558,146	2,598,510	48,760	73.0
13	Penn Bridge Company	28,126	20,180	0	71.7
14	Acme Engr'g & Contracting Co	2,985,225	2,525,460	5,820	84.6
14R	Thomas F. Riley	724	620	0	Finished.
15	Atlantic, Gulf & Pacific Company	1,481,692	1,378,956	0	Finished.
16	United Construction Company	92,956	74,690	2,980	80.4
17	The Scofield Company *a*	842,418	57,560	0	Finished.
17	Alexander Murdoch *b*	(812,286)	744,290	0	Finished.
18	Kelley Bros. Contracting Company	611,382	476,979	0	Finished.
19	Great Lakes Construction Company	891,401	749,690	3,750	84.0
20A	Houston Barnard	490,837	299,420	9,820	61.0
20B	S. Pearson & Son, Inc.	1,032,210	459,710	24,270	44.5
20C	American Pipe & Construction Co	585,720	594,190	16,250	101.4
20D	American Pipe & Construction Co	2,685,477	276,880	80,280	10.3
21	Lane Brothers Company	1,323,150	751,050	58,110	56.8
22	M. Fitzgerald	127,521	40,500	700	31.8
22A	Lupfer & Remick	27,099	0	0	0.0
23	Millard & Lupton Company	1,824,389	1,024,280	27,770	56.2
24	Kingsbury Construction Company	44,368	19,510	5,960	44.0
25	Atlantic, Gulf & Pacific Company	1,707,192	1,525,560	7,780	89.4
26	Lake Erie Dredging Company	40,057	35,443	0	Finished.
27	Kinser Construction Company *a*	723,269	378,650	0	Finished.
27A	Holler & Shepard *b*	(486,464)	211,370	11,730	43.4
29	Maryland Dredging & Contr'g Co	691,250	451,110	14,580	65.3
30	Acme Engr'g & Contracting Co	2,660,461	1,523,150	74,630	57.3
31	Casey & Murray	831,302	744,040	5,730	89.5
32	Penn Bridge Company	46,797	44,375	0	Finished.
33	Penn Bridge Company	175,537	165,183	0	Finished.
34	M. Fitzgerald	22,449	22,258	0	Finished.
35	Gilmour-Horton-Allen Company	760,917	641,250	13,980	84.2
36	J. D. Miller	46,800	46,800	0	Finished.
37	Henry P. Burgard	2,462,609	1,137,930	56,890	46.2
38	Henry Tosh & Son	16,870	16,287	0	Finished.
39	James Stewart & Company	1,048,674	230,720	0	22.0
40	United Engr'g & Contracting Co	2,252,144	1,738,530	2,390	77.2
41	Butler Bros. Construction Company	273,238	241,644	0	Finished.
42	Shanley-Morrissey, Inc. *a*	1,047,366	478,670	0	45.7
43	M. A. Talbot Company	1,413,016	301,340	29,240	21.3
44	Scott Brothers	1,760,913	922,270	38,100	52.4
45	Scott Brothers	472,802	418,652	0	Finished.
46	Kinser Construction Company	1,305,930	734,720	11,840	56.2
47	Crowell-Sherman-Stalter Company	1,279,328	830,850	0	65.0
48	Crowell-Sherman-Stalter Company	1,679,212	835,140	44,850	49.7
49	American Pipe & Construction Co	735,227	543,700	17,990	73.9
50	Buffalo Dredging Company	971,769	233,890	24,850	24.0
51	Alto Construction Company	397,093	149,630	12,440	37.7
53	Scott Brothers	167,585	164,576	0	Finished.
54	Hunkin-Conkey Construction Co	251,370	194,150	24,060	77.3
55	Arthur McMullen	945,840	883,350	0	Finished.
55R	Joseph Kalk & Alfred S. Brown	7,561	7,526	0	Finished.
56	Flood & Van Wirt Company	319,956	0	0	0.0

Progress of Contract Work—(*Continued*).

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Oct. 1, 1912.
		Put under contract.*	Done to Oct. 1, 1912.	Done during Sept., 1912.	
57	New York State Dredging Corp.	$93,596	0	0	0.0
60	Empire Engineering Corporation	1,491,317	$1,287,080	$3,530	86.2
61	Cleveland & Sons Company	1,090,853	861,870	19,570	79.0
62	I. M. Ludington's Sons, Inc.	2,515,043	1,629,640	36,640	64.8
63	H. S. Kerbaugh, Inc	2,349,697	1,421,190	10,710	60.5
64	Empire Engineering Corporation	1,335,434	827,740	22,330	62.0
66	Empire Engineering Corporation	854,394	764,240	3,870	89.4
67	Larkin & Sangster	1,208,110	739,440	44,910	61.2
68	Shanley-Morrissey, Inc	1,024,282	946,168	0	Finished.
69	I. A. Hodge & Co	240,206	210,850	2,450	87.7
70	Shanley-Morrissey, Inc. *a*	779,636	236,240	0	30.3
71	Shanley-Morrissey, Inc. *a*	1,561,119	821,960	0	52.7
72	Shanley-Morrissey, Inc. *a*	1,221,112	618,900	0	52.3
73	E. M. Graves	518,829	517,223	0	Finished.
75	United Construction Company	42,917	40,980	0	Finished.
76	The T. A. Gillespie Company	1,512,011	790,870	13,640	52.2
77	The T. A. Gillespie Company	1,701,808	1,176,270	61,350	69.1
78	Cunningham-Woodard Company	49,026	50,068	0	Finished.
79	Lupfer & Remick	37,480	33,980	0	Finished.
80	Walter Bradley	117,391	109,700	0	Finished.
82	Groton Bridge Company	28,841	21,320	0	73.9
85	Lupfer & Remick	13,151	12,010	0	91.3
86	Lathrop, Shea & Henwood Company	43,440	4,940	0	11.3
88	Lathrop, Shea & Henwood Company	29,642	7,280	3,520	24.5
89	Owego Bridge Company	59,616	0	0	0.0
90	D'Olier Engineering Corporation	180,318	168,890	210	93.6
90A	Lupfer & Remick	64,020	980	620	1.5
91	The Hollington Company	44,985	20,080	280	44.6
101	Barrally & Ingersoll	40,640	3,300	1,620	8.1
104	R. B. Murdock	39,370	590	0	1.5
105	Skene & Richmond	258,710	30,620	9,920	11.8
	Totals	$74,794,998	$49,195,877	$1,000,150	.....
	Cayuga and Seneca Canal.†				
A	Scott Brothers	$376,233	$208,680	$15,760	55.5
B	Crowell-Sherman-Stalter Company	1,436,597	740,820	70,630	51.5
H	James H. Dawes	205,649	0	0	0.0
I	The Central Dredging Company	215,639	0	0	0.0
	Totals	$2,234,118	$949,500	$86,390	.....

* Includes all alternations in force to date. *a* Suspended by order of the Canal Board *b* Relet to complete former contracts, contract price not included in total. † Authorized by separate appropriation.

Brief Account of Contract Work or September.

The following pages show what has been done during the month on the several contracts now in force on the Barge canal. The Erie canal contracts are described in order from Waterford west to Buffalo, and the Champlain and Oswego canal contracts follow, in order from south to north, while the Cayuga and Seneca canal contracts are given from east to west.

Erie Canal.

Contract No. 16.— For eleven steel highway bridges, ten of which are at various points on Contracts Nos. 25 and 27, Champlain canal, and the remaining one on Contract No. 11, Erie canal.

On Contract No. 11, the bridge was completed. Some 59,169 pounds of steel were placed.

On Contracts Nos. 25 and 27-A no work was done.

Contract No. 13.— For three bridge superstructures on Contract No. 12 and two on Contract No. 18.

No contract work was done.

Contract No. 2-E.— For completing the construction of the canal from the Mohawk river at Waterford to a point about one-fourth mile above the head of Lock No. 3.

Below Lock No. 2, 185 cu. yds. of stone filling were placed in north crib approach and 28 cu.yds. of second-class concrete and 1,110 lbs. of iron castings in snubbing-posts of south approach.

On the guide pier above Lock No. 3, excavation was finished, 102 cu. yds. of material being removed. Some 431 cu. yds. of second-class and 205 cu. yds. of reinforced concrete were placed, completing the piers and 18 bridges. About 1,920 lbs. of cast-iron, 120 lbs. of structural steel and 38,571 lbs. of metal reinforcement were also used and 2,030 lin. ft. of foundation piles driven.

Contract No. 11.— For prism excavation and construction from Contract No. 2 to Mohawk river below Crescent, including Locks Nos. 4, 5 and 6, highway, bridge abutments, guard-gate, masonry, etc.

About 106 cu. yds. of second-class concrete were placed in north core wall of Lock No. 5 and in snubbing-posts in rock cut and below Lock No. 4.

The Page bucket machine excavated about 2,100 cu. yds. of material from borrow-pit, below Lock No. 4, which was placed as embankment in the south core wall.

The by-pass of Lock No. 6 is completed. About 50 cu. yds. were removed from prism below the lock. Second-class embankment is being placed on the north side and at the north core wall of the lock, material being taken from spoil. The embankment on the north side of the lock is being graded and shaped.

The Vulcan shovel removed about 2,800 cu. yds. of material from the rock cut, which was placed in embankment at the south core wall of Lock No. 4. About 700 cu. yds. of material were also removed in stripping top of bank at rock cut and 162 cu. yds. were excavated from ditches on north side.

About 299 sq. ft. of surface were channeled in rock cut, completing this work.

Quantities: Excavation, 5,991 cu. yds.; embankment, 7,608 cu. yds.; concrete, 106 cu. yds.; iron and steel, 4,124 lbs.

Contract No. 14.— For work from Contract No. 11 to a point near Rexford Flats aqueduct, including Lock No. 7 and Dams Nos. 2 and 3; also for constructing Locks Nos. 13, 14 and 15, Dams Nos. 9, 10 and 11, Mindenville retaining dam, etc.

At Dam No. 2, Crescent, the quarry was cleaned and worked, material hauled and plant installed to close openings in the dam.

At Dam No. 3, Lock No. 7, Vischers Ferry, general work included erection of cableway over south channel dam, moving the McMyler from the island to the old tow-path, unloading and hauling material to close openings in Dam No. 3, etc.

About 1,360 cu. yds. of material were removed from prism and 1,000 cu. yds. from the apron of south abutment at Dam "F." To complete the foundation of Dam "E," about 850 cu. yds. were temporarily spoiled, which reduces the total excavation to about 1,528 cu. yds.

About 650 ft. B. M. of yellow pine were placed for walks and fenders on the Stoney gate.

Of first-class concrete, about 54 cu. yds. were placed in closing openings in Dam "D" and about 12 cu. yds. in Dam "F" and abutment. Of second-class concrete, about 290 cu. yds. were placed in closing openings in Dam "D" and about 244 cu. yds. between Dams "E" & "F." Dam "E" is now completed. About 1,173 lbs. of structural steel were also used for flash-board sockets in Dams "E" & "F." About 127 lbs. of metal were used in bracket and fenders at the Stoney gate, and 442 lbs. of machinery in cables with pawl and ratchet.

At Rexford Flats a traveling derrick was erected and some facing timber delivered.

On the Dunsbach-Fort's Ferry road clearing the right of way and hauling in plant and material progressed. Excavating for roadway and culverts began. A small amount of concrete was placed in culverts.

On Rosendale road material was delivered and some clearing done.

At Dam No. 9, Lock No. 13, Yosts, work consisted in grading behind lock and guide walls, and along the north bank of the river, repair of concrete surfaces and other incidental repairs. No contract work was done.

At Dam No. 10, Lock No. 14, Canajoharie, the coffer-dams in the river are being removed by means of a 12-in hydraulic dredge.

At Dam No. 11, Lock No. 15, Fort Plain, no work was done.

Contract No. 14-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 14 to new burial plots outside the flow lines.

Contract completed. Final estimates being prepared.

Contract No. 20-D.— For dredging Mohawk river channel, constructing stream entrances, etc., between deep water below Rexford Flats aqueduct and center of bridge at Dam No. 9, at Yosts.

At the aqueduct stripping and drilling rock continued until September 24, when high water stopped the work. About 450 cu. yds. of loose rock were hauled to spoil on south side.

At Cranesville the hydraulic dredge *Amsterdam* continued prism excavation, spoiling about 37,200 cu. yds. of material on south side of bridge, west of Erie canal bridge No. 76 and on N. Y. C. R. R. spoil area on north side of the river.

The dipper-dredge also excavated from prism, casting over to the north.

At Tribes Hill prism excavation above the lock continued to September 25, when high water stopped the work. Some 1,520 cu. yds. of rock were placed in spoil.

At Danoscara creek the work was also stopped by high water. Some 5 cu. yds. of lining, 33 sq. yds. of stone paving and 23 cu. yds. of riprap had been placed.

The hydraulic dredge *Mohawk* continued prism excavation, spoiling about 117,470 cu. yds. of material on south side between the canal and the river.

Quantities: Excavation, 156,640 cu. yds.

Contract No. 8-A.— For constructing Dam No. 4 and Lock No. 8 at Scotia and other incidental work pertaining to the completion of the locks at Rotterdam and Cranesville.

At Dam No. 4, Lock No. 8, Scotia, general work of hauling plant and materials, erecting buildings, boilers, derricks, compressors, washing-plant for gravel and sand, etc., progressed.

The caissons are numbered from south to north. One lift of forms was set up for caisson No. 18. Two lifts were set up for Nos. 16 and 17, the working chambers concreted and the caissons lowered to the river bed.

No work was done at Rotterdam and Cranesville.

Contract No. 17.— For constructing Dam No. 7 and Lock No. 11, at Amsterdam, and Dam No. 8 and Lock No. 12, at Tribes Hill.

The bent material has been removed from the upper lock gates. Material is in place and partly riveted.

Contract No. 20-C.— For dredging Mohawk river channel, constructing stream entrances, etc., between center of bridge at Dam No. 9, at Yosts, and center of bridge at Dam No. 10, at Canajoharie.

The dipper-dredge continued prism excavation, placing material in scows, which were dumped in deep water and along the bank of the river.

At Flat creek, about 108 cu. yds. of riprap were placed before September 22, when high water flooded and stopped the work.

About 64 cu. yds. were excavated, 11 cu. yds. of lining, 44 sq. yds. of paving, and 33 cu. yds. of riprap were placed at other stream entrance work.

About 446 cu. yds. of fourth-class riprap were placed along the north side of the river.

Quantities: Excavation, 27,932 cu. yds.

Contract No. 86.— For the construction of one span of a highway bridge over the Mohawk river at Canajoharie, to replace two existing spans, which will be removed.

The temporary bridge has been completed and traffic turned over it. The two bridge spans have been raised from their seats, the brick and concrete flooring nearly all removed and the work of taking down the pier started. But little excavation so far has been required.

Contract No. 20-B.— For dredging Mohawk river channel, constructing stream entrances, etc., between the center of bridge at Dam No. 10, at Canajoharie, and the upper miter wall of the new lock at Mindenville.

The Lobnitz breaker continued work on ledge rock in prism, material being removed to scows by a dipper-dredge. About 2,055 cu. yds. of this material were placed on north shore.

The second dipper-dredge and the hydraulic disposal boat continued prism excavation, the other dipper-dredge also working with the disposal boat when not excavating broken rock.

Material was pumped on the Kyser and McAllister spoil areas and the coarse material placed along the north bank of the river. The orange-peel dredge excavated about 1,175 cu. yds. from prism.

At Otsquaga creek about 1,652 cu. yds. were excavated and 80 cu. yds. of riprap and 32 sq. yds. of first-class stone paving laid.

Quantities: Excavation, 37,498 cu. yds.

Contract No. 20-A.— For dredging Mohawk river channel, etc., between Castle creek and upper miter wall of lock at Little Falls.

The orange-peel bucket machine continued excavating in Castle creek on the south side of the feeder culvert, placing material in embankment or spoil on north side of prism. Some material on the west side of the creek was placed in north embankment and spoil with wheelbarrows. The hydraulic dredge *Indian Castle* excavated in prism at the junction of the river and land lines during the first half of the month. Material was deposited in spoil on the Uhle lot. Cobblestones in the bottom hindered the work at this location. During the latter half of the month the dredge worked in the river about one mile west of the junction, but only a small yardage was removed as this locality is mostly rock.

Additional wash wall was laid, the stone being brought from Contracts Nos. 30 and 31.

A wooden trestle was built across the canal opposite Erie canal bridge No. 131, for transporting wash wall stone to north side.

Quantities: Excavation, 9,832 cu. yds.; embankment, 250 cu. yds.; wash wall, 794 cu. yds.

Contract No. 31.— For improving the Erie canal at Little Falls, constructing Lock No. 17, and modifying the dam and constructing guard-gates at Rocky Rift.

The spoil slopes east and west of Adirondack Mill were trimmed. Prism excavation progressed on north side of canal opposite the mill. Stone were crushed and shipped. On south side of prism, near the old elevator, the cut was also trimmed to lines. The rock nose on roadway near reservoir was removed. A small amount was excavated on south side, east of guard-gate, for embankment at southeast approach of Hansen avenue bridge.

Material was borrowed near the lock storehouse to complete the embankment at the east end of retaining wall No. 2, near the

old reservoir. Gravel from Contract No. 30 and crusher waste from the old elevator were used for lining the roadway from William street east to the Adirondack mill road. The inclined roadway west of Seeley street was also lined. Riprap was also placed on both of the roadways mentioned. Metal sinkers were placed on needles for lower buffer-beams.

With a few minor exceptions, work on this contract is completed. Some of the plant has been shipped away.

Quantities: Excavation, 3,483 cu. yds.; embankment, 691 cu. yds.; lining, 185 cu. yds.; riprap, 355 cu. ys.; metal in buffer-beams, 9,119 lbs.; metal in guard-gates, 2,361 lbs.

Contract No. 30.— For dredging channel in Mohawk river and land line from Little Falls to Sterling creek, constructing Lock No. 18 at Jacksonburg, Dam No. 14 and guard-gates at Herkimer, retaining dam at Frankfort, bridges, etc.

From Little Falls to Lock No. 18: Rock excavation continued until September 16, when the upper coffer-dam gave way, filling the site. Since then, work has consisted of repairs to the coffer-dam and shipping rock from the storage pile. Some 4,461 cu. yds. of rock were excavated. The 16-in. dredge *Herkimer* continued river excavation, removing 63,124 cu. yds. to spoil on Eysaman island.

From Lock No. 18 to Washington street, Herkimer: Tower No. 5 borrowed excavation for embankment material. Wash wall and riprap stone were delivered on both banks at various points. The Thew shovel excavated from prism, including borrow for embankment east of Spoon creek on south side.

At Washington street, Herkimer, most of the steel sheet-piling was removed.

At the guard-gate, Herkimer: Foundation piles and steel sheet-piling were driven in the cut-off wall, excavations cleaned out, etc., in readiness for placing concrete. About three-quarters of the cut-off wall was placed, the parapet walls for north approach of highway bridge were completed and a portion of concrete protection for the old stone arches was placed.

At Dam No. 14: The coffer-dam for the northern portion of the dam was placed and excavation began. High water in the river delayed the work. The slope of the prism was trimmed, material being placed in north embankment area.

West of Herkimer, clearing and blasting stumps continued. The 20-in. dredge *Clinton* removed 90,348 cu. yds. of material from prism to spoil.

At Frankfort bridge, south pier, wooden and steel sheet-piling were driven and excavation commenced.

At East Schuyler bridge, south abutment, all foundation piles were driven and 441 cu. yds. of concrete were placed.

About 2½ miles west of Frankfort, tower No. 4 did considerable work in filling the old river channel. The derrick sloper continued operating on south bank.

Contract No. 29.— For excavating prism from Sterling creek to Oneida-Herkimer county line, constructing lock at Sterling creek, bridges, etc.

Excavation amounted to about 8,522 cu. yds., of which 570 cu. yds. were from Knapp brook entrance, 409 cu. yds. from culvert, the remainder being retentions allowed.

About 1,800 ft. B. M. of sheeting and bracing were used at Lock No. 19.

About 12,181 cu. yds. of embankment were formed, of which 11,435 cu. yds. were prism banks on north side and 746 cu. yds. were at culvert. About 2,460 lin. ft. of foundation piles were driven at culvert, and 199 sq. ft. of steel sheet-piling at Sterling creek dam. Some 1,252 cu. yds. of concrete were placed, of which 313 cu. yds. were at Sterling creek dam, 808 cu. yds. in main lock walls and cut-off wall and 131 cu. yds. in invert and breast wall of Lock No. 19. About 251 lbs. of bolts and washers were used in piling at Sterling swamp.

At Lock No. 19, 733 lbs. of steel and 638 lbs. of reinforcing metal were used. Also, 2,381 lbs. of metal were placed in lock gates and 28,749 lbs. in buffer-beams.

Sterling creek dam is nearly completed. Work on the lock has progressed more slowly. High water and bad weather compelled suspension of work at stream entrances. Day's culvert is about ready for placing concrete.

Contract No. 42.— For prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillway, stream entrances, culverts, etc.

Contract canceled. Final estimates being prepared.

Contract No. 43.— For constructing the canal from a point just south of Oriskany road to about 1,500 feet west of Mud creek.

Clearing was continued. The dredge *Stanwix* excavated 53,566 cu. yds. and 44,318 cu. yds. were removed by the cableway. About 61,118 cu. yds. of embankment were formed.

At Nine-Mile creek spillway, 320 cu. yds. of second-class concrete were placed, using 1,144 lbs. of reinforcement. About 602 lbs. of structural steel were also used. At Oriskany road bridge, 2,417 lbs. of steel were used. At Mill street bridge, 18,159 lbs. of steel were used, 492 lin. ft. of stone curbing placed on approaches and 367 sq. yds. of wood block paving laid.

Quantities: Piles, 13,427 lin. ft.; iron and steel, 22,322 lbs.

Contract No. 44.— For constructing the canal from about 1,500 feet west of Mud creek, west of Rome, to about three miles west of New London, including junction lock, Locks Nos. 21 and 22, bridges, culverts, spillways, stream entrances, etc.

The total excavation was 46,836 cu. yds. Shovel No. 1347 removed 17,955 cu. yds., shovel No. 841, 12,546 cu. yds., and tower No. 2, 12,985 cu. yds. from prism. A derrick and teams removed 2,701 cu. yds. from Lock No. 21 and approach walls, tower No. 1 took out 608 cu. yds. from Lock No. 22, and 41 cu. yds. were removed from ditch entrances and spillways.

About 16,154 ft. B. M. of sheeting and bracing and 3,360 sq. ft. of steel piling were used, and 915 cu. yds. of second-class concrete laid in Lock No. 21 and approach walls. About 1,093 lin. ft. of foundation piles were driven. About 126 lbs. of structural steel, 3,148 lbs. of metal reinforcement and 325 lbs. of steel castings were used. Some 2,014 lbs. of metal were placed in lock gates, 23,242 lbs. in lock valves and 27,628 lbs. in buffer-beams.

About 2,313 cu. yds. of second-class concrete, using 4,298 lbs. of reinforcement, were placed at Lock No. 22. Also, 393 lbs. of structural steel, 258 lbs. of steel castings and 7,546 lbs. of machined castings were used. About 155 lbs. of metal were placed in lock gates, and 338 lbs. in buffer-beams.

Contract No. 12.— For excavating prism between Oneida lake and Mosquito Point bridge on Seneca river; constructing Lock No. 23 and other structures.

Ladder-dredge No. 2 excavated about 10,000 cu. yds. of material at Brewerton cut. Dipper-dredge No. 4 continued work. Dipper-dredge No. 6 in Morgan's cut, moved 20,000 cu. yds., spending much time in casting over to make room for scows. Dipper-dredge No. 7 cleaned up a section in the Big Bend cut, removing about 10,000 cu. yds.

At Lock No. 23 concrete work on the lock proper was finished. Excavation for foundation of power-house has progressed rapidly

and 200 cu. yds. of concrete were placed. The upper gates are nearly riveted. Quoin and miter-posts are being framed.

Quantities: Excavation, 136,307 cu. yds.; embankment, 4,156 cu. yds.; concrete, 402 cu. yds.; metal in gates, 76,013 lbs.; metal in needle-dams, 20,900 lbs.; metal in lock valves, 21,353 lbs.; iron castings, 5,491 lbs.

Contract No. 101.— For the construction of a steel highway bridge superstructure at Three River Point.

A coffer-dam was built around the south abutment and excavation was nearly completed. Pile-driving commenced. No work was done on approaches.

Contract No. 22.— Bridges on Contract No. 12.

At Free bridge, the coffer-dams for south abutment were removed, the coffer-dam for pier built, excavation completed and about 30 piles driven.

At Bonta's bridge, a steel coffer-dam was driven for south abutment and excavation is in progress.

At Weedsport bridge, plant arrived and a stiff-leg derrick and pile-driver were erected on south side of river.

Quantities: Excavation, 243 cu. yds.; embankment, 299 cu. yds.; piles, 792 lin. ft.

Contract No. 57.— For constructing the canal through Onondaga lake outlet.

Work not yet begun.

Contract No. 22-A.— For constructing a new substructure, approach spans and approaches for a bridge over the Erie canal at Weedsport.

Work not yet begun.

Contract No. 46.— For the construction of the canal from Fox Ridge to the southeast corner of the town of Galen, including Lock No. 25, a movable dam at May's Point, bridges, etc.

At the movable dam, concreting the south abutment is completed.

At County Line bridge, the concrete plant from the dam was transferred. Work on the south approach was in progress during the first half of the month. Removal of defective concrete at the south abutment continued.

At Lock No. 25, 5,305 sq. ft. of steel piling were driven at north and south walls, and 422 cu. yds. of concrete were placed in southwest approach wall.

Contract No. 47.— For the construction of the canal from the southeast corner of the town of Galen to a point near the N. Y. C. & H. R. railway crossing at Lyons, including Lock No. 26, a dam across the Clyde river, highway bridge, stream entrance, etc.

No contract work was done.

Contract No. 5-A.— For the completion of Contract No. 5, from Mosquito Point to Campbell's bridge, including construction of Owasco creek entrance, reconstruction of bridge at Mosquito Point and new pier and approaches at Howland island bridge, etc.

Dredge No. 1 operated during the greater part of the month, completing its work on September 25. It will be taken to Brewerton. Dredge No. 5 operated for a few days at the lower end of the contract.

At Howland bridge concreting for north pier progressed.

At Mosquito Point bridge, north abutment, excavation and sheet-piling was completed and 88 foundation piles were driven.

Quantities: Excavation, 28,212 cu. yds.; embankment, 1,068 cu. yds.; concrete, 193 cu. yds.; sheet-piling, 196 ft. B. M.; piles, 2,272 lin. ft.

Contract No. 89.— For the construction of five superstructures and one substructure for highway bridges between Lyons and Palmyra on Contracts Nos. 48, 76 and 77.

At Forgham street bridge, plant is being erected for building the substructure.

Contract No. 48.— For the construction of the canal from a point near the N. Y. C & H. R. railway crossing at Lyons to a point near the West Shore railway crossing at East Newark, including Locks Nos. 27 and 28-A, dam and power-house, retention dam across Canandaigua outlet, spillway, culverts, highway, bridge, approaches, etc.

The dredge *Lyons* operated until September 15, removing about 23,000 cu. yds. of material at the east end of the contract. The dipper-dredge *Erie* closed down on September 27. Both dredges are under repair.

At Geneva street and vicinity, 14,500 ft. B. M. of sheeting and bracing, 6,400 sq. ft. of steel sheet-piling, 71 lin. ft. of curbing, 180 sq. yds. of paving and 807 cu. yds. of concrete were placed. Also, 2,128 lin. ft. of foundation piles were driven. Riveting was completed and painting nearly finished. Forms are being placed for concrete floor.

At Lock No. 28-A, 5,700 cu. yds. were excavated and 1,092 cu. yds of concrete placed. The south wall is completed.

At the blue cut, 861 cu. yds. of wash wall were built. About 129 cu yds. of lining were placed at Poorhouse bridge.

At the west end of the contract, the Browning crane removed 11,178 cu yds. of material.

Quantities: Excavation, 41,600 cu. yds.; embankment, 2,458 cu. yds.

Contract No. 76.— For the construction of the canal from a point near the West Shore railway crossing at East Newark to a point about one-half mile east of Port Gibson.

At Lock No. 28-B, fenders were placed and steelwork painted.

At East avenue bridge, 143 cu. yds. of concrete were placed in the substructure.

At Newark dock, 261 cu yds. of concrete were placed.

At Main street bridge, 5,038 cu yds. were excavated and 129 cu. yds. of concrete placed in north abutment.

About 45 cu. yds. of concrete were also placed at Allerton's bridge and 360 cu. yds. at Peek's bridge.

At the spillway 392 cu. yds. were taken out, completing excavation, and 279 cu. yds. of concrete placed.

Contract No. 77.— For constructing the canal from one-half mile east of Port Gibson to one-half mile west of Palmyra, including Lock No. 29, power-plant, bridges, culverts, etc.

The suction-dredge *Palmyra* removed 72,100 cu. yds. from prisms and at guard-gate. About 3,358 cu. yds. of wash wall were constructed. Steam-shovel No. 20 removed 13,755 cu. yds from prism in lower approach.

At the power-house, 267 cu. yds. of concrete were placed and about 780 cu. yds. were laid in upper approach walls.

At Railroad avenue bridge, work has been pushed. Riveting is nearly completed and the north approach is being built with material excavated from prism at lower lock approach.

At Lock No. 29, erection of lock-gates and other steelwork is well under way.

Quantities: Excavation, 93,414 cu. yds.; concrete, 1,048 cu. yds.; dry stonework, 4,561 cu. yds.; sawed lumber, 33,105 ft. B. M.; piles, 961 lin. ft.; iron and steel, 45,623 lbs.

Contract No. 49.— For prism construction from a point about 500 ft. east of Yellow Mills bridge, about one mile west of Pal-

myra, to the Monroe county line, including Lock No. 30, sluice-gates, highway bridges, culverts, etc.

The usual general work and repairs continued during the month. Most of the work was done in the vicinity of Lock No. 30, except about 285 cu. yds. of lining which were placed on south approach of Frear's bridge. The Browning crane and McMyler excavator removed 5,350 cu. yds. of material from prism. About 73,000 ft. B. M. of wooden sheet-piling were driven above the lock. Some 1,820 cu. yds. were excavated from the lower approach and 117 cu. yds. of concrete were placed. At the lock proper, 56 cu. yds of concrete were placed. Erecting and riveting steelwork in gates and valves progressed. Quoin and miter-posts were framed. At the upper approach 218 cu. yds. of concrete were placed.

Quantities: Excavation, 7,170 cu. yds.; concrete, 1,434 cu. yds.; dry stonework, 699 cu. yds.; iron and steel, 27,285 lbs.

Contract No. 63.— For enlarging present canal and constructing culverts, sluiceways, waste-weir, guard-gates, dock walls, bridges, highway changes, etc., between Wayne-Monroe county line and Kings Bend.

The dredge *Fairport* continued excavating from prism west of Fairport, spoiling material in adjacent widewaters. Later, it was laid up until material ahead can be loosened by blasting.

The Lidgerwood excavator operated in prism between Cobb's and Parker street bridges, in Fairport, casting material to adjacent embankment and spoil. A team outfit excavated from borrow-pit near the new north approach to Knapp's bridge, placing the material in the approach. Considerable lining was placed on the tow-path in various localities and on the north approach to Cartersville bridge. Some coping-stone for wash wall was placed in scattered localities. Wooden fencing was built on approaches to Cobb's and Parker street bridges. Steel for the superstructure of Cartersville bridge was delivered and erection commenced.

Quantities: Excavation, 20,700 cu. yds.; embankment, 8,015 cu. yds.; lining, 70 cu. yds.; wash wall, 15 cu. yds.; wooden fencing, 1,472 lin. ft.; structural steel, 40,000 lbs.

Contract No. 23.— For prism excavation between Kings Bend and Genesee river, and construction of Locks Nos. 32 and 33, guard-lock, bridges, culverts, etc.

Pumping for drainage at Lock No. 32 was continued during the entire month and at Lock No. 33 intermittently during the month.

Shovel No. 938 excavated prism in the light cut west of Lock No. 32, disposing material in north dike west of the lock and on sides of by-pass channel west of Kingsley road.

Shovel No. 667 began September 19, excavating prism just east of Lock No. 33 and sending material to south bank of by-pass channel at Lock No. 32.

Shovels Nos. 1178 and 2449 continued excavating prism in the deep cut west of East Henrietta road, flattening the side slopes from 1 on 1½ to a series of benches. Material was sent to north and south banks in the vicinity of South avenue.

The Browning excavator worked part of the time trimming slopes of prism east of Lock No. 32. Other excavation was by hand, teams and drag-scraper in various places, for wash wall, riprap and paving, trimming slopes, footings for lower guide wall and foot-bridge of Lock No. 32, and south abutment of West Henrietta road bridge.

Second-class concrete, plain and reinforced, was placed in lower guide wall and foot-bridge of Lock No. 32, south skew-back of West Henrietta road bridge and snubbing-post settings.

Considerable riprap protection was placed in the by-pass channel and at spillway of Lock No. 32. Some wash wall was placed west of this lock. The miter-sills of Lock No. 33 were set.

Quantities: Excavation, 58,041 cu. yds.; embankment, 28,973 cu. yds.; lining, 41 cu. yds.; sheeting and bracing, 2,477 ft. B. M.; concrete, 880 cu. yds.; riprap, 418 cu. yds.; wash wall, 1,162 cu. yds.; foundation piles, 424 lin. ft.

Contract No. 21.— For prism excavation and construction of bridge abutments, guard-lock, etc., from the Genesee river west 2.56 miles to a point just west of the N. Y. C. & H. R. railway crossing.

Pumping for drainage continued at Brooks avenue, Scottsville road, guard-lock site and at west end of contract.

Shovel No. 3 continued excavating in rock cut and shovel No. 4 in earth cut west of the B. R. & P. railway. Material was spoiled. The locomotive crane was used part of the time in digging a drainage ditch and handling stone for crusher at the guard-lock. Additional concrete was placed at the guard-lock. From 7 to 10 steam-drills worked most of the time ahead of shovel No. 3.

Four or five channeling machines worked practically all the time, cutting rock to prism lines.

At the B. R. & P. bridge both abutments were completed and erection of steelwork commenced.

Quantities: Excavation, 110,428 cu. yds.; concrete, 418 cu. yds.

Contract No. 82.— For furnishing and erecting three steel highway bridge superstructures on Contract No. 21, near Rochester.

No contract work was done.

Contract No. 75.— For construction of three guard-gate superstructures on Contracts Nos. 60, 61 and 64.

A small amount of work was done during the month under the extra order.

Contract No. 105.— For the construction of five lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Union street, Spencerport; Washington street, Adams Basin; Park avenue, Brockport; Hulberton; Gasport.

At Washington street bridge, Adams Basin, all plant except that for steelwork, was shipped to Hulberton. Falsework was placed and steel erection commenced.

At Park avenue bridge, Brockport, concrete was placed in the north pit and for about one-third of the wing. Sheet-piling was required to enclose the wing.

At Hulberton bridge, south well, 655 cu. yds. were excavated and 9,815 ft. B. M. of sheeting and bracing used. Gravel was unloaded and the pit pumped.

At Gasport bridge, about 725 cu. yds. were excavated by hand at south abutment.

Contract No. 60.— For prism excavation and construction of culverts, bridge structures, etc., between a point 1.75 miles east of South Greece and a point 0.5 mile west of Adams Basin.

A small amount was excavated from prism and at turning basin, most of the material being used for filling north approach of bridge No. 95. Excavation of spoil on north berme and grading berme bank also continued. Wash wall was laid at various places. Tile drain was also laid to take care of seepage from canal banks.

At bridge No. 95 the north approach is being shaped and graded, and wooden fence built. At bridges Nos. 94, 95 and

96, floors were repaired. At bridges Nos. 100, 102 and 103 wooden fencing was also placed in good condition.

The contract work is approaching completion. The remaining work consists of repairing small defects, etc., in the various structures.

Quantities: Excavation, 1,224 cu. yds.; embankment, 2,522 cu. yds.; wash wall, 111 cu. yds.; paving, 10 sq. yds.; fencing, 18 lin. ft.

Contract No. 61.— For prism excavation and construction of culverts, bridges, waste-weir, etc., between a point 0.5 mile west of Adams Basin and Monroe-Orleans county line.

Excavator No. 1 continued removal of old berme bank east of the guard-gate, material being transported by scows to embankment on south side, east of Park avenue and to several low places along the line. Excavator No. 2 worked most of the time in prism below grade, material being also used at the Park avenue bank. Excavator No. 3 was not in operation. Some material was excavated by hand at various points for wash wall. Banks were graded and wash wall and coping stone for bridge placed.

At bridge No. 109 the Clinton street retaining wall is nearly completed and some backfilling was done.

Quantities: Excavation, 5,102 cu. yds.; embankment, 16,945 cu. yds.; wash wall, 2,799 cu. yds.; masonry coping, 7 cu. yds.; concrete, 412 cu. yds.; lining, 2,307 cu. yds.

Contract No. 62.— For prism excavation and construction of culverts, bridge substructures, etc., between Orleans-Monroe county line and a point near Eagle Harbor bridge.

Albion section:

About 25,000 cu. yds. were excavated, by the Bucyrus excavator with a drag-line on berme east of bridge No. 125, the Lidgerwood excavator on berme east of Lattin's bridge, and by Brown traveling crane at ditch east from culvert No. 73. Some 5,700 cu. yds. of embankment were formed by the Bucyrus and Lidgerwood machines.

About 109 cu. yds. of concrete were placed at culverts Nos. 74 and 76. At the latter culvert some 8,000 lbs. cast-iron pipe were also laid.

At Gaines bridge some 13,000 lbs. of structural steel were placed in position. About 3,300 cu. yds. of wash wall were built at various points. Work on approaches progressed at bridges Nos. 122, 123, 126 and 130.

Holley section:

About 1,500 cu. yds. of material were removed from ditch at culvert No. 68. About 680 cu. yds. of embankment were formed on berme east of Tuttle's bridge. Some 390 cu. yds. of lining were placed on tow-path between Holley and McCarthy's bridges. About 300 cu. yds. of rubble masonry were built on tow-path west of Hulberton bridge. About 2,150 cu. yds. of wash wall were built on both banks, east of Brockville waste-weir and between Hulberton and McGuire's bridges. Some 117 cu. yds. of second-class stone paving were laid at Holley waste-weir and 100 cu. yds. of third-class stone paving at culverts Nos. 66, 67 and 68.

Quantities: Excavation, 27,323 cu. yds.; embankment, 6,390 cu. yds.; concrete, 113 cu. yds.; dry stone work, 6,157 cu. yds.; sawed lumber, 7,510 ft. B. M.; iron and steel, 21,612 lbs.

Contract No. 64.— For improvement from 600 ft. west of Prospect street, Medina, to 100 ft. east of Gasport bridge.

About 27,400 cu. yds. of material were excavated by the dredges *Empire* and *Peconic* from prism, and by derrick-boats for wash wall at various points. Some 4,200 cu. yds. of embankments were formed by the dredges and a derrick-boat. About 1,450 cu. yds. of lining were placed on tow-path in various localities. Some 1,550 cu. yds. of wash wall were also built.

Contract No. 66.— For prism excavation and constructing bridges and approaches, culverts, etc., from 100 ft. east of Gasport bridge to 600 ft. east of Lockport locks.

About 6,624 cu. yds. were excavated, of which 531 cu. yds. were removed from prism by an orange-peel dredge near culvert No. 117, 260 cu. yds. at south approach at Lake avenue bridge and the remainder by the ladder-dredge *Mineola* between Young's and Millard's bridges. Some 294 cu. yds. of second-class embankment and 263 cu. yds. of lining were placed at Lake avenue bridge.

Contract No. 67.— For construction of Locks Nos. 34 and 35 and approaches, etc., at Lockport.

Some 420 cu. yds. were excavated, 220 cu yds. being rock from lock No. 34. About 200 cu. yds. were removed at south abutment of Main street bridge.

About 6,301 cu. yds. of concrete were laid, of which 4,988 cu. yds. were in Lock No. 34, 1,000 cu. yds. in Lock No. 35 and 313 cu. yds. at Main street bridge.

About 61,945 lbs. of iron castings were used for culvert linings at middle thrust walls.

Contract No. 40.— For constructing the canal, culvert entrances, guard-gates, stream entrances, bridges, etc., from the Lockport locks to Sulphur Springs guard-lock.

At Summit street bridge, 48 lin. ft. of lattice railing were placed at south abutment.

At Prospect street bridge, 290 cu. yds. were excavated from prism by hand and wheelbarrows, 117 cu. yds. of material backfilled and 8 cu. yds. of second-class concrete placed in south piers. Some 28 cu. yds. of reinforced concrete, using 2,705 lbs. of reinforcement, were placed at south abutment.

At Riley's bridge, 72 cu. yds. were removed by slip scrapers, and 23 cu. yds. of lining placed on south approach.

At Hawley's bridge, 19 cu. yds. were excavated by hand and 31 cu. yds. of third-class concrete placed in culvert at south approach. Some 68 cu. yds. of reinforced concrete, using 7,209 lbs. of metal, were also placed.

At Hinman road, 128 cu. yds. were excavated by slip scrapers from drainage ditch on north side.

At the new guard-gate, 32 cu. yds. of second-class concrete were placed in west wing of south abutment.

Contract No. 19.— For prism excavation, rebuilding bridges, constructing masonry culvert, concrete-capped pile docking, etc., between Sulphur Springs guard-lock and mouth of Ellicott creek.

West of Pickard's bridge 21,415 cu. yds. of material were removed by the hydraulic dredge *Niagara,* on double shifts. West of Bush's bridge 22,000 cu. yds. were cast over by the dipper-dredge *Buffalo,* operating on triple shifts. This material will be rehandled by the *Niagara.* The derrick boat *Teddy* was employed at Martinsville dock, placing tie-rods and cables.

Champlain Canal.

Contract No. 70.— For dredging a channel in the Hudson river from outlet of Barge canal at Waterford to Lock No. 1.

Contract canceled.

Contract No. 71.— For constructing Lock No. 1 and Dam No. 1, above Waterford, and dredging Hudson river from Lock No. 1 to lower Mechanicville lock.

Contract canceled.

Contract No. 69.— For constructing Lock No. 2, at lower Mechanicville.

Drilling and excavating in wheel-pits and tail-race is nearly completed, material being spoiled on mainland. Forms for wheel-pits, tubes, etc. are being constructed.

Three unsuccessful attempts were made to unwater the site of the upper guide wall. An earthen bulkhead is now being constructed within the caisson to enable about one-fourth of its area to be unwatered. Work of trimming miter-posts and sills continued, those for the lower gates being completed.

Concrete was placed in floor of head-race behind lock wall.

Quantities: Excavation, 676 cu. yds.; concrete, 296 cu. yds.

Contract No. 72.— For dredging Hudson river from lower Mechanicville to Stillwater.

Contract canceled.

Contract No. 88.— For the construction of a steel highway bridge at Schuylerville, within the limits of Contract No. 73.

Steel for bridge was received and stored along highway at west approach. Concrete work on the west pier was completed. Another stiff-legged derrick was installed to expedite the work. Steel sheet-piling was pulled, ferried across the river and is being driven at the pier.

Quantities: Concrete, 155 cu. yds.; sawed lumber, 6,552 ft. B. M.; iron and steel, 903 lbs.

Contract No. 1.— For dredging Hudson river from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; constructing Crocker's Reef dam and approaches to "Land Line," etc.

Work closed down indefinitely.

Contract No. 24.— For constructing guard-gate at Crocker's Reef.

Foundations for west abutment of east pier, sluice-gates, and the prism bottom north of guard-gate, were drilled, blasted and excavated. Material was spoiled along the old tow-path.

Placing concrete in the southwest approach wall was completed and similar work at the west abutment and northeast approach wall progressed. Footings were placed for the east pier and sluice-gate wall.

Concreting was delayed by wet weather and by inability to secure gravel. Forms for the east pier are completed, except bracing.

Quantities: Excavation, 205 cu. yds.; concrete, 887 cu. yds.

Contract No. 54.— For constructing Lock No. 7, at Fort Edward.

About 3,245 cu. yds. of material were removed from prism and used to fill along the slope of the old tow-path and as backfill at the northeast approach wall. Some 3,067 cu. yds. of concrete were placed in walls, completing the lock, except two sections. Miter-sills, quoin-posts and miter-posts for lock-gates were fitted and placed. Valves were set and buffer-beams placed and swung. The upper gates of the lock were hung.

Contract No. 27-A.— For completing the construction of the canal between the Hudson river at Fort Edward and the south end of Contract No. 25, at Dunhams Basin road.

About 16,175 cu. yds. were excavated from spoil banks, of which 9,208 cu. yds. were on east side, 96 cu. yds. east of Bond creek, and the remainder on west side. Other excavation amounted to 5,937 cu. yds. of which 1,273 cu. yds. were from west side to form embankment, 516 from wash wall notch on west side and 238 cu. yds. from notch on east side, 268 cu. yds. at Siphon spillway and 3,642 cu. yds. from prism at Argyle street.

About 11,535 ft. B. M. of sheeting and bracing were used, of which 4,724 ft. B. M. were at siphon spillway and 6,811 ft. B. M. were at East street bridge.

About 4,435 cu. yds. of embankment were formed, of which 1,836 cu. yds. were in prism, 2,047 cu. yds. back of northwest approach wall of Lock No. 8, 452 cu. yds. at west approach to Argyle street bridge and 100 cu. yds. at Broadway bridge.

About 583 cu. yds. of second-class concrete were placed in northwest approach wall to Lock No. 7, completing that structure. Some 3,280 lbs. of steel were placed in the power-plant at Lock No. 8.

Under the extra work order of August 8, the dams across the canal are nearly completed, both piers of East street bridge are excavated to water line and the concrete in both old abutments is drilled, ready to be removed.

Contract No. 25.— For prism excavation between a point 0.6 mile north of Comstock post-office and highway crossing at Dunhams Basin; constructing Lock No. 9, spillways, power-plant, etc.

About 16,264 cu. yds. were excavated, of which 278 cu. yds. were from east abutment of Comstock bridge, 2,324 cu. yds. were borrowed for highway embankment south of Comstock, 13,364 cu. yds. were removed from by-pass and prism by teams and sloper north of Lock No. 9 and 300 cu. yds. by scrapers at Dunhams Basin.

About 261 cu. yds. of lining were placed, of which 174 cu. yds. were on the highway, and the remainder under paving at Smith Basin and Henry's bridges.

At Comstock bridge, east abutment, about 7,000 ft. B. M. of sheeting and bracing were used and 53 cu. yds. of second-class concrete laid.

About 1,171 cu. yds. of wash wall were built, of which 412 cu. yds. were between Lock No. 9 and Henry's bridge, 264 cu. yds. at East creek spillway and 495 cu. yds. in northeast approach to Lock No. 9. At East creek spillway 49 cu. yds. of third-class riprap and a like amount of ballast were placed. Some 391 sq. yds. of paving were laid, of which 323 sq. yds. were at Henry's bridge and the remainder at Smith Basin. About 975 lin. ft. of fencing were also placed at Henry's bridge.

Other work included transporting stone for wash wall, digging ditch on east side at Fort Ann, building baffle-dam at stream entrance, rigging drill-boats at Comstock, etc.

Oswego Canal.

Contract No. 39.— For dredging channel in Oswego river, constructing stream entrances, excavating through Hinmansville cut-off, etc., between Three River Point and Fulton, except portion covered by Contract No. 53.

No contract work was done, though work continued on the adjacent highways.

Contract No. 85.— For constructing a steel bridge over the lock at Phoenix.

No contract work was done.

Contract No. 80.— For constructing a concrete dam across the Oswego river at Phoenix.

Contract finished. Final estimates being prepared.

Contract No. 104.— For the construction of a reinforced concrete arch bridge over the Barge canal at Broadway, Fulton.

No contract work was done.

Contract No. 10-A.— For completing the construction of the canal, raising the upper dam, etc., from Broadway bridge, Fulton, south to Contract No. 39.

About 1,588 cu. yds. of material were excavated, of which 784 cu. yds. were at the Taintor gates and 804 cu. yds. from face of dike. Some 13,308 ft. B. M. of hemlock lumber were used in cribs Nos. 2 and 3. Some 522 ft. B. M. of white oak were also used for snubbing-posts. About 378 cu. yds. of first-class concrete were laid at Taintor gates and 51 cu. yds. in upper dam. About 196 cu. yds. of second-class concrete were also laid in piers on cribs Nos. 1, 2 and 3. At the upper west approach wall of Lock No. 2, 3,150 sq. ft. of concrete surface were finished. About 170 cu. yds. of stone filling were placed in cribs Nos. 2 and 3. Some 232 lbs of $\frac{5}{8}$-in. chain were used in fastenings for floating fenders.

Contract No. 10-B.— For completing the construction of the canal from the upper end of Lock No. 2, Fulton, north to Contract No. 37.

At retaining wall between Locks Nos. 2 and 3, 100 cu. yds. of material were excavated and 270 cu. yds. of second-class concrete laid.

At Lock No. 3, 8,090 cu. yds. were excavated, 101 sq. ft. of rock channeled and 5,609 lin. ft. of line drilling done. At the lower west approach wall of the lock, 56 cu. yds. of second-class concrete were laid. Below the lock, 1,440 cu. yds. of material were excavated. About 430 lbs. of metal were used in fasteners for floating fenders.

Contract No. 37.— For dredging a channel in Oswego river, constructing Locks Nos. 5 and 6, dams, bulkheads and other structures, and the removal of Battle Island and High dams, between Contract No. 10, at Fulton, and Contract No. 35, at Oswego.

Excavation amounted to 24,998 cu. yds., of which 5,784 cu. yds. were removed by dredge between Contract No. 10 and Lock No. 5, 4,984 cu. yds. at Battle Island cut-off, 3,639 cu. yds. between Locks Nos. 5 and 6, 4,831 cu. yds. between Lock No. 6 and Contract No. 35, 57 cu. yds. from Minetto retaining wall and dike,

630 cu. yds. from bulkhead No. 5, 504 cu. yds. from upper guide wall, 887 cu. yds. from lower guide wall, 3,215 cu. yds. from Lock No. 5, and 648 cu. yds. from bulkhead No. 6. About 100 cu. yds. of embankment were formed at bulkhead No. 6.

At Minetto retaining wall, 1,266 cu. yds. of second-class concrete were placed, using 7,426 lbs. of reinforcement. Some 309 lin. ft. of bolt-holes were drilled.

At bulkhead No. 5, 556 cu. yds. of second-class concrete were laid, using 2,279 lbs. of reinforcement. About 1,067 lbs. of structural steel and 466 lbs. of machined castings were also used. Some 279 lin. ft. of bolt-holes were drilled in rock.

Contract No. 35.— For prism excavation and constructing Locks Nos. 7 and 8, bulkheads, culverts, spillways, etc., between a point one-half mile above Utica street bridge and harbor line north of Bridge street, at Oswego.

About 2,029 cu. yds. were excavated from prism and 1,320 cu. yds. of embankment were placed at west wall.

At retaining wall west of Lock No. 7, 138 cu. yds. were excavated and 491 cu. yds. of concrete placed.

In the piers above Lock No. 7, 84 cu. yds. of second-class concrete were placed, using 1,225 lbs. of reinforcement. Some 389 lbs. of plain iron castings were also used here.

At Lock No. 7, 600 ft. B. M. of white oak were placed in miter-sills, 117 cu. yds. of second-class concrete placed, 1,173 lbs. of structural steel used, 39,348 lbs. of metal placed in gates, 22,387 lbs. in valves and 115 lbs. of plain castings used.

At culvert No. 5, the gate-hoists were about three-quarters completed.

Cayuga and Seneca Canal.

Contract A.— For constructing Lock No. 1 and Dam No. 1, near Cayuga.

At Lock No. 1, excavation for northeast approach wall was completed and about 500 cu. yds. of concrete laid. Work was delayed by lack of sand and gravel and retaining steel sheeting in place. About 2,000 sq. ft. of steel sheet-piling were driven in the northwest approach wall.

At the dam, east abutment, excavation was completed, piles and sheet-piling driven, and about 700 cu. yds. of concrete laid. About two-thirds of the riprap on the two slopes near the east abutment was laid. About 90 per cent of the abutment is done.

A new floating derrick for use on the dam is being constructed.

Steel for one gate was delivered at Mud lock.

Quantities: Excavation, 1,954 cu. yds.; concrete, 1,300 cu. yds.; dry stone work, 172 cu. yds.; sawed lumber, 25,836 ft. B. M.; piles, 171 lin. ft.

Contract B.— For excavating a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from Cayuga lake to Seneca Falls and from Waterloo to deep water in Seneca lake.

The dredge *Clyde,* working down stream opposite south end of Kipp's island, removed 336,333 cu. yds. of material, placing spoil on the island and also on spoil area west of cut. For the first half mile, the dredge completed the full cut, and for a thousand feet further north a half-section to grade was excavated. Dikes were built south of the Free Bridge road.

Contract H.— For excavating a channel in Cayuga lake inlet at Ithaca from a point about 300 feet north of Cascadilla street, to deep water in Cayuga lake.

Contract work not yet begun.

Contract I.— For improving the canal from deep water in Seneca lake to Montour Falls, about 2.75 miles.

Recently awarded. Work not yet begun.

Water-Supply.

Contract No. 50.— For constructing dam, waste-gates and spillway across West Canada creek at Hinckley.

Excavating with wheelbarrows progressed at north abutment and along wasteway on north side of creek. Inside the coffer-dam the work was seriously interrupted by leaks which flooded the pumping plant, etc. Efforts were made to operate the drills whenever conditions permitted.

Embankment was formed on the east side of the core wall, the steam-roller being used to compact it.

Second-class concrete and Cyclopean masonry were placed in north abutment, north gate-chamber and spillway. Some riprap was also placed. Cast-iron, 60-in. pipe and specials were placed at north gate-chamber.

Quantities: Excavation, 1,466 cu. yds.; embankment, 14,108 cu. yds.; lining, 25 cu. yds.; concrete, 640 cu. yds.; Cyclopean masonry, 2,514 cu. yds.; riprap, 117 cu. yds.; cast-iron pipe and

specials, 70,176 lbs.; metal reinforcement, 3,470 lbs.; bolt-holes drilled, 63 lin. ft.

Contract No. 51.— For constructing a canal feeder from Trenton Falls on West Canada creek to Nine-Mile creek below South Trenton, with gate-house, culverts, highway, etc.

Browning shovel No. 1, continued excavating in feeder prism near the intake, removing about 4,500 cu. yds. Excavator "K" removed 7,400 cu. yds. Teams removed about 5,700 cu. yds. from prism, ditches and culverts. The traveling derricks removed 6,800 cu. yds. from prism. At one of the culverts, the floor-slab was laid and highway approaches backfilled. Wrought-iron pipe-railing was placed at several culverts.

Quantities: Excavation, 24,433 cu. yds.; embankment, 1,429 cu. yds.; reinforced concrete, 34 cu. yds.; reinforcing metal, 2,528 lbs.; railing, 166 lin. ft.

Contract No. 55.— For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black river canal, with four locks and aqueduct over Mohawk river, highway change, bridges, etc.

Contract completed. Final estimates being prepared.

Contract No. 55-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 55, Delta reservoir, to a new cemetery outside the flow lines.

Contract finished. Final estimates being prepared.

Power-Supply.

Contract No. 91.— For building and equipping a hydro-electric power-plant on the Erie canal near the east end of Crescent dam.

At the power-house, the cornice frame of structural steel was placed in position, wall surface finished and forms built for roof. Painting the penstock was nearly completed.

Contract No. 90.— For constructing hydro-electric power-plants at Baldwinsville on the Erie canal, and at Smiths, Comstock and Whitehall on the Champlain canal. Also for constructing equipment for operating and lighting the following locks: No. 24, Erie canal; Nos. 1, 2, 7 and 8, Oswego canal; Nos. 9, 11 and 12, Champlain canal.

On the Oswego canal, at Lock No. 2, a lamp-pole was set and a small amount of electrical equipment installed.

Contract No. 90-A— For constructing hydro-electric power-plants, sub-stations and equipments to complete installations at Locks Nos. 1, 2, 7 and 8, Oswego canal.

At Lock No. 2, Oswego canal, about 51 cu. yds. of second-class concrete were laid in foundation of power-house.

Progress of Plans Being Prepared.

The following pages contain detailed accounts of the plans in process of preparation at the main and residency offices, showing progress up to the first of October. An order according to location is followed, as explained in the account of contract work for the month.

Erie Canal.

Contract No. 115.— For deepening lock and approach at Troy dam. Plans completed.

Contract No. 18-A.— For completing the construction of the canal from Mindenville to Castle creek. Plans 83 per cent completed.

Contract No. 84.— For the construction of two steel lift-bridges at Clyde, within the limits of Contract No. 47. Work on plans suspended, pending an investigation as to elimination of grade crossing.

Contract No. 59.— For constructing a movable dam in the Genesee river at Rochester. Plans 90 per cent completed.

Contract No. 106.— For the construction of four lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Exchange street, Lockport; Middleport; Prospect street, Medina; Main street, Brockport. Plans 96 per cent completed.

Contract No. 65.— For work from the west end of Contract No. 9, at a point near Beal's bridge, to the east end of Contract No. 64, at a point 600 feet west of Prospect street, Medina, including Oak Orchard creek crossing. Plans 98 per cent completed.

Oswego Canal.

Contract No. 103.— For the construction of a concrete arch bridge over the Oswego river and a bascule bridge over the Oswego canal, at Phoenix, N. Y. Plans completed.

Contract No. 37-R.— For the removal of bodies from the Minetto cemetery, within the limits of Contract No. 37, to a new cemetery outside the flow line. Plans 95 per cent completed.

Cayuga and Seneca Canal.

The following is the revised arrangement of plans on this canal.

Contract C.— For constructing locks, dam, etc., at Seneca Falls. Plans 70 per cent completed.

Contract D.— For excavating a channel in Seneca river from the vicinity of Demont's bridge through the village of Waterloo. Plans completed.

Contract E.— For constructing a lock, dam, etc., at Waterloo. Plans 70 per cent completed. Former Contract F is now included.

Power-Supply.

Contract No. 94.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 26 to 35, inclusive, on the Erie canal. Plans 70 per cent completed.

Plans before Canal Board.

Contract No. 92.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 2 to 19, inclusive, on the Erie canal, and Locks Nos. 1 to 8, inclusive, on the Champlain canal. Plans before the Canal Board.

Contracts Advertised.

Contract No. 74.— For dredging Mohawk river from Hudson river to Contract No. 2-E. Length 0.48 mile. Plans approved by the Canal Board August 27, 1912. Advertised. Bids opened November 12, 1912.

Contract No. 14-A.— For clearing lands along the Mohawk river and removing buildings, from Crescent dam to Rexford Flats. Length, 14.2 miles. Plans approved by the Canal Board September 25, 1912. Advertised. Bids opened October 22, 1912.

Bids Opened.

Contract No. 70-A.— For the completion of the work remaining to be done on Contract No. 70. Bids opened September 24, 1912. Awarded.

Contract No. 71-A.— For the completion of the work remaining to be done on Contract No. 71. Advertised for September 24, 1912. No bids.

Contract No. 72-A.— For the completion of the work remaining to be done on Contract No. 72. Bids opened September 24, 1912. One bid. Not awarded.

Award of Contract.

The detailed bids of the following contract appear elsewhere.

Contract No. 56.— Glens Falls feeder. Bids opened September 24, 1912. Four bids were received, the lowest of which was by Flood & Van Wirt, of Hudson Falls, N. Y., to whom it was subsequently awarded at $319,956.20.

Recapitulation — Progress on Plans.

Contract No.	DESCRIPTION.	Canal.	Progress on plans.
115	Deepening lock at Troy	Erie	Completed.
14A	Clearing lands on Contract 14	Erie	Advertised.
18A	Mindenville to Castle creek	Erie	83 per cent completed.
37R	Removal of bodies at Minetto	Oswego	95 per cent completed.
56	Glens Falls feeder	Champlain	Awarded.
59	Rochester harbor dam	Erie	90 per cent completed.
65	Canal and aqueduct at Medina	Erie	98 per cent completed.
70A	Supplemental to Contract 70	Champlain	Bids opened.
71A	Supplemental to Contract 71	Champlain	Bids opened.
72A	Supplemental to Contract 72	Champlain	Bids opened.
74	Dredging Hudson river to Contract 2-E	Erie	Advertised.
84	Two lift-bridges at Clyde	Erie	Suspended.
92	Power-plants and lock equipments	Erie, Champlain	Before Canal Board.
94	Power-plants, etc., for Locks 26 to 35	Erie	70 per cent completed.
103	Bridge at Phoenix	Oswego	Completed.
106	Bridges on Contracts 61, 64, 65 and 67	Erie	96 per cent completed.
C	Locks, dam, etc., at Seneca Falls	Cayuga and Seneca	70 per cent completed.
D	Dredging, Demont's bridge to Waterloo	Cayuga and Seneca	Completed.
E	Lock, dam, etc., at Waterloo	Cayuga and Seneca	70 per cent completed.

BIDS FOR CONTRACT I.

ITEMS.	Measure	Quantities.	ENGINEER'S ESTIMATE.		CENTRAL DREDGING CO., 542 ROCKEFELLER BUILDING., CLEVELAND, OHIO.		JAMES STEWART & CO., 30 CHURCH ST., NEW YORK, N. Y.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.
Excavation	cu. yd.	1,144,400	$0 25	$286,100 00	$0 17½	$197,409 00	$0 199	$227,735 60
Forming embankment	cu. yd.	2,700	15	405 00	15	405 00	15	405 00
Third-class riprap	cu. yd.	6,330	2 50	15,825 00	2 50	15,825 00	2 50	15,825 00
Maintaining highway traffic	lump sum	.....	2,000 00	2,000 00	2,000 00	2,000 00	2,000 00	2,000 00
Total	.....	.....	.....	$304,330 00	.....	$215,639 00	.....	$245,965 60

BIDS FOR CONTRACT I — (*Continued*).

ITEMS.	Measure.	Quantities.	CROWELL-SHERMAN-STALTER CO., CLEVELAND, OHIO.		H. P. BEIRGARD, BUFFALO, N. Y.		N. Y. STATE DREDGING CORP., 853 POWERS BUILDING, ROCHESTER, N. Y.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.
Excavation	cu. yd.	1,144,400	$0 199	$227,735 60	$0 24	$274,656 00	$0 24½	$280,378 00
Forming embankment	cu. yd.	2,700	15	405 00	18	486 00	15	405 00
Third-class riprap	cu. yd.	6,330	2 50	15,825 00	3 00	18,990 00	3 00	18,990 00
Maintaining highway traffic	lump sum	.....	2,000 00	2,000 00	2,200 00	2,200 00	2,000 00	2,000 00
Total	.....	.....	.....	$245,965 60	.....	$296,332 00	.....	$301,773 00

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		FLOOD & VAN WIRT, HUDSON FALLS, N. Y.		R. T. FORD, ALBANY, N. Y.		HOLLER & SHEPARD, 202-204 E. & B. BLDG., ROCHESTER, N. Y.		BUFFALO DREDGING CO., BUFFALO, N. Y.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.
Excavation	cu. yd	95,800	$0 60	$57,480 00	$0 60	$57,480 00	$0 72	$68,976 00	$0 648	$62,078 40	$1 00	$95,800 00
Removing old masonry	cu. yd	1,850	1 35	2,497 50	1 35	2,497 50	1 35	2,497 50	1 488	2,752 80	1 35	2,497 50
Sheeting and bracing	M. ft. B. M.	54	50 00	2,700 00	50 00	2,700 00	60 00	3,240 00	53 00	2,862 00	50 00	2,700 00
Forming embankment	cu. yd	30,100	15	4,515 00	15	4,515 00	18	5,418 00	162	4,876 20	15	4,515 00
Lining	cu. yd	13,840	1 50	20,760 00	1 80	24,912 00	1 80	24,912 00	1 605	22,213 20	2 00	27,680 00
Puddle	cu. yd	100	2 00	200 00	2 30	230 00	2 40	240 00	2 00	200 00	2 00	200 00
Sawed lumber (yellow pine)	M. ft. B. M.	109	75 00	8,175 00	75 00	8,175 00	90 00	9,810 00	82 50	8,992 50	105 00	11,445 00
Sawed lumber (white oak)	M. ft. B. M.	2.3	100 00	230 00	100 00	230 00	100 00	230 00	105 00	241 50	100 00	230 00
Foundation piles	lin. ft	1,640	40	656 00	48	787 20	48	787 20	42	688 80	40	656 00
Wooden sheet-piling	M. ft. B. M.	153	50 00	7,650 00	50 00	7,650 00	60 00	9,180 00	52 50	8,032 50	50 00	7,650 00
Second-class concrete	cu. yd	20,160	8 00	161,280 00	7 80	157,248 00	8 10	163,296 00	8 40	169,344 00	8 15	164,304 00
Reinforced concrete	cu. yd	132	20 00	2,640 00	20 00	2,640 00	24 00	3,168 00	22 00	2,904 00	20 00	2,640 00
First-class masonry bridge coping	cu. yd	7.5	20 00	150 00	24 00	180 00	20 00	150 00	22 00	165 00	20 00	150 00
Second-class stone paving	sq. yd	1,820	2 00	3,640 00	2 00	3,640 00	2 20	4,004 00	2 16	3,931 20	2 00	3,640 00
Structural steel	lb	112,800	06	6,768 00	06½	7,332 00	06	6,768 00	066	7,444 80	06	6,768 00
Metal reinforcement	lb	99,000	04	3,960 00	04	3,960 00	04	3,960 00	042	4,158 00	04	3,960 00
Bronze	lb	4,900	50	2,450 00	50	2,450 00	50	2,450 00	525	2,572 50	50	2,450 00
Iron castings, plain	lb	35,800	04½	1,611 00	04½	1,611 00	04½	1,611 00	04¾	1,700 50	04½	1,611 00
Portland cement sidewalks	sq. yd	56	2 00	112 00	2 00	112 00	2 00	112 00	2 00	112 00	2 00	112 00
Relaying sidewalks	sq. yd	40	50	20 00	50	20 00	50	20 00	50	20 00	50	20 00
Cobblestone paving, relaid	sq. yd	20	1 00	20 00	1 00	20 00	1 00	20 00	1 00	20 00	1 00	20 00
Brick pavement	sq. yd	150	2 00	300 00	2 20	330 00	2 40	360 00	2 20	330 00	2 00	300 00
Wooden fence	lin. ft	4,250	20	850 00	24	1,020 00	24	1,020 00	22	935 00	20	850 00
24″ x 36″ Sluice gates, complete in place	each	36	225 00	8,100 00	225 00	8,100 00	240 00	8,640 00	243 00	8,748 00	225 00	8,100 00
Wrought iron pipe railing	lin. ft	90	1 00	90 00	1 00	90 00	1 00	90 00	1 00	90 00	1 00	90 00
Wrought iron railing reset	lin. ft	90	10	9 00	10	9 00	10	9 00	10	9 00	10	9 00
Gate hoists, class "A"	each	4	800 00	3,200 00	900 00	3,600 00	960 00	3,840 00	864 00	3,456 00	800 00	3,200 00
Gate hoists, class "B"	each	8	600 00	4,800 00	700 00	5,600 00	720 00	5,760 00	648 00	5,184 00	600 00	4,800 00
Metal in taintor gate	lb	17,000	07½	1,275 00	07¾	1,317 50	07½	1,275 00	08¼	1,402 50	07½	1,275 00
Raising bridges	each	15	100 00	1,500 00	100 00	1,500 00	120 00	1,800 00	108 00	1,620 00	200 00	3,000 00
Coffer-dams, pumping, bailing and draining	lump sum	.....	10,000 00	10,000 00	10,000 00	10,000 00	12,000 00	12,000 00	10,500 00	10,500 00	20,000 00	20,000 00
Totals	.....	.....	.....	$317,638 50		$319,956 20		$345,643 70		$337,584 40		$380,672 50

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NOVEMBER, 1912

Barge Canal Bulletin

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THE STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK

JOHN A. BENSEL, State Engineer and Surveyor
ALEXANDER E. KASTL, Special Deputy State Engineer

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CONTENTS

Progress of Contract Work..... 334
Brief Account of Contract Work for October..... 335
Progress of Plans Being Prepared..... 360
Plans before Canal Board..... 361
Contracts Advertised..... 362
Award of Contracts..... 362
Bid for Contract No. 70-A..... 363
Bid for Contract No. 72-A..... 364
Bids for Contract No. 14-A..... 364

Progress of Contract Work.

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Dec. 1, 1912.
		Put under contract.*	Done to Dec. 1, 1912.	Done during Nov., 1912.	
1	Empire Engineering Corporation	$580,424	$474,400	0	81.8
2	Ferguson Contracting Company *a*	990,076	694,390	0	70.1
2E	Holler & Shepard *b*	(307,023)	279,710	$1,300	91.1
3	Sundstrom & Stratton	657,273	633,290	0	Finished.
4	Empire Engineering Corporation	726,780	720,073	0	Finished.
4B	E. J. Doyle & Company	1,351	1,332	0	Finished.
5	Empire Engineering Corporation *a*	156,941	125,820	0	80.2
5A	James Stewart & Company *b*	(326,902)	286,010	26,540	87.5
6	F. A. Maselli	1,026,550	1,033,864	0	Finished.
7	Groton Bridge Company	101,930	98,929	0	Finished.
8	Pittsburg-Eastern-Company *a*	1,516,789	920,420	0	60.7
8A	The Foundation Company *b*	(799,399)	67,610	29,040	8.5
9	Thomas Crimmins Contracting Co	803,297	655,461	0	Finished.
10	McDermott Contracting Company *a*	1,206,019	668,360	0	55.4
10A	The T. A. Gillespie Company *b*	(774,514)	130,290	16,700	74.7
10B	Oswego Construction Co., Inc. *b*	(516,336)	152,570	44,490	29.5
11	Fort Orange Construction Co	1,333,199	1,203,240	5,810	90.3
12	James Stewart & Company	3,573,146	2,674,520	36,360	74.8
13	Penn Bridge Company	24,329	20,180	0	83.0
14	Acme Engr'g & Contracting Co	2,985,225	2,561,590	10,060	85.8
14A	John Henkes	4,318	0	0	0.0
14R	Thomas F. Riley	724	629	0	Finished.
15	Atlantic, Gulf & Pacific Company	1,481,692	1,378,956	0	Finished.
16	United Construction Company	92,956	74,690	0	80.4
17	The Scofield Company *a*	842,418	53,794	*c* 3,766	Finished.
17	Alexander Murdoch *b*	(812,286)	751,352	7,062	Finished.
18	Kelley Brcs. Contracting Company	611,382	476,979	0	Finished.
19	Great Lakes Construction Company	891,401	761,270	5,290	85.4
20A	Houston Barnard	490,837	314,660	6,400	64.0
20B	S. Pearson & Son, Inc	1,032,210	517,060	22,940	50,1
20C	American Pipe & Construction Co	607,035	611,320	4,860	100.7
20D	American Pipe & Construction Co	2,720,883	575,680	155,000	21.2
21	Lane Brothers Company	1,323,150	806,500	24,810	61.0
22	M. Fitzgerald	127,521	53,000	4,090	41.6
22A	Lupfer & Remick	27,099	0	0	0.0
23	Millard & Lupton	1,824,389	1,074,240	23,330	58.9
24	Kingsbury Construction Company	44,368	25,650	1,620	57.8
25	Atlantic, Gulf & Pacific Company	1,707,192	1,538,860	7,950	Finished.
26	Lake Erie Dredging Company	40,057	35,443	0	Finished.
27	Kinser Construction Company *a*	723,269	378,650	0	Finished.
27A	Holler & Shepard *b*	(486,464)	233,390	11,080	48.0
29	Maryland Dredging & Contr'g Co	691,250	473,780	8,750	68.5
30	Acme Engr'g & Contracting Co	2,660,461	1,664,500	67,720	62.6
31	Casey & Murray	831,302	745,900	0	Finished.
32	Penn Bridge Company	46,797	44,375	0	Finished.
33	Penn Bridge Company	175,537	165,183	0	Finished.
34	M. Fitzgerald	22,449	22,258	0	Finished.
35	Gilmour-Horton-Allen Company	723,632	652,780	1,420	90.2
36	J. D. Miller	46,800	46,800	0	Finished.
37	Henry P. Burgard	2,499,894	1,279,720	68,470	51.2
37R	Anthony Salladin & John Henrick	4,891	0	0	0.0
38	Henry Tosh & Son	16,870	16,287	0	Finished.
39	James Stewart & Company	1,048,674	261,290	28,400	24.9
40	United Engr'g & Contracting Co	2,252,082	1,745,460	3,220	77.5
41	Butler Bros. Construction Company	273,238	241,644	0	Finished.
42	Shanley-Morrissey, Inc. *a*	1,047,366	478,670	0	45.7
43	M. A. Talbot Company	1,421,551	339,160	20,120	23.8
44	Scott Brothers	1,760,913	982,650	21,750	55.8
45	Scott Brothers	472,802	418,652	0	Finished.
46	Kinser Construction Company	1,305,930	794,920	12,020	60.8
47	Crowell-Sherman-Stalter Company	1,279,328	830,850	0	65.0
48	Crowell-Sherman-Stalter Company	1,679,212	898,420	31,280	53.5
49	American Pipe & Construction Co	735,227	579,450	18,270	78.7
50	Buffalo Dredging Company	971,769	314,980	22,960	32.4
51	Alto Construction Company	397,093	163,520	1,660	41.2
53	Scott Brothers	167,585	164,576	0	Finished.
54	Hunkin Conkey Construction Co	251,370	208,340	2,100	83.0
55	Arthur McMullen	945,840	883,350	0	Finished.

Progress of Contract Work—(*Continued*).

Contract No.	CONTRACTOR.	Total Value of Work.			Percentage of work done to Dec. 1, 1912.
		Put under contract.*	Done to Dec. 1, 1912.	Done during Nov., 1912.	
55R	Joseph Kalk & Alfred S. Brown	$7,561	$7,526	0	Finished.
56	Flood & Van Wirt Company	319,956	9,590	$7,930	3.0
57	New York State Dredging Corp	93,596	0	0	0.0
60	Empire Engineering Corporation	1,491,317	1,300,540	5,820	87.1
61	Cleveland & Sons Company	1,090,853	886,240	10,880	81.2
62	I. M. Ludington's Sons, Inc	2,515,043	1,717,880	60,670	68.3
63	H. S. Kerbaugh, Inc	2,349,362	1,462,010	22,740	62.3
64	Empire Engineering Corporation	1,335,434	873,670	21,550	65.5
66	Empire Engineering Corporation	854,394	773,390	1,870	90.6
67	Larkin & Sangster	1,208,110	800,150	11,710	66.3
68	Shanley-Morrissey, Inc	1,024,282	946,168	0	Finished.
69	I. A. Hodge & Company	240,206	220,610	6,160	91.9
70	Shanley-Morrissey, Inc. *a*	779,636	236,240	0	30.3
70A	The Central Dredging Company *b*	(759,159)	0	0	0.0
71	Shanley-Morrissey, Inc. *a*	1,561,119	821,960	0	52.7
72	Shanley-Morrissey, Inc. *a*	1,221,112	618,900	0	50.6
73	E. M. Graves	518,829	517,223	0	Finished.
75	United Construction Company	42,917	40,980	0	Finished.
76	The T. A. Gillespie Company	1,512,011	846,870	22,310	56.0
77	The T. A. Gillespie Company	1,701,808	1,253,670	44,970	73.7
78	Cunningham-Woodard Company	49,026	50,068	0	Finished.
79	Lupfer & Remick	37,480	33,980	0	Finished.
80	Walter Bradley	117,391	110,886	0	Finished.
82	Groton Bridge Company	28,841	21,320	0	73.9
85	Lupfer & Remick	13,151	12,070	0	Finished.
86	Lathrop, Shea & Henwood Company	43,440	5,560	280	12.8
88	Lathrop, Shea & Henwood Company	35,784	14,370	6,340	40.2
89	Owego Bridge Company	59,616	1,160	1,160	1.9
90	D'Olier Engineering Corporation	180,239	169,580	260	94.2
90A	Lupfer & Remick	64,020	4,870	1,070	7.6
91	The Hollington Company	44,985	22,180	680	49.3
101	Barrally & Ingersoll	40,640	10,640	1,210	26.2
104	R. B. Murdock	39,370	590	0	1.5
105	Skene & Richmond	258,710	65,970	18,750	25.5
	Totals	$74,886,332	$51,338,558	$995,466	.....
	Cayuga and Seneca Canal.†				
A	Scott Brothers	$376,233	$234,530	$9,520	62.4
B	Crowell-Sherman-Stalter Company	1,436,597	816,230	19,110	56.8
H	New York State Dredging Corp	216,510	25,160	21,850	11.6
I	The Central Dredging Company	215,639	0	0	0.0
	Totals	$2,244,979	$1,075,920	$50,480	.....

* Includes all alterations in force to date. † Authorized by separate appropriation.
a Suspended by order of the Canal Board. *b* Relet to complete former contracts, contract price not included in total. *c* A decrease.

Brief Account of Contract Work for November.

The following pages show what has been done during the month on the several contracts now in force on the Barge canal. The Erie canal contracts are described in order from Waterford west to Buffalo, and the Champlain and Oswego canal contracts follow, in order from south to north, while the Cayuga and Seneca canal contracts are given from east to west.

Erie Canal.

Contract No. 16.— For eleven steel highway bridges, ten of which are at various points on Contracts Nos. 25 and 27, Champlain canal, and the remaining one on Contract No. 11, Erie canal.

No contract work was done.

Contract No. 13.— For three bridge superstructures on Contract No. 12 and two on Contract No. 18.

No contract work was done.

Contract No. 2-E.— For completing the construction of the canal from the Mohawk river at Waterford to a point about one-fourth mile above the head of Lock No. 3.

Below Lock No. 2, 418 cu. yds. of embankment were placed behind the south approach, 200 lin. ft. of wooden fence built and the lining renewed on south approach to Fourth street bridge. Some 96 sq. yds. of cobble-stone gutter were placed along the north side of New street, south of Lock No. 2. About 500 ft. B. M. of yellow pine fenders and fastenings for same were placed on north lower approach wall of Lock No. 2. Framing and placing fenders on guide pier above Lock No. 3 was completed, about 6,000 lbs. of metal being used. About 10 cu. yds. of wash wall were placed on north side. Considerable work was done during the month in cleaning up the contract. With the exception of a few small items of trimming, the work on this contract is completed.

Quantities: Embankment, 418 cu. yds.; sawed lumber, 18,624 ft. B. M.; iron and steel, 5,962 lbs.

Contract No. 11.— For prism excavation and construction from Contract No. 2 to Mohawk river below Crescent, including Locks Nos. 4, 5 and 6, highway, bridge abutments, guard-gate, masonry, etc.

About 328 cu. yds. of second-class concrete were placed, of which 63 cu. yds. completed the north wall and 95 cu. yds. the north docking above Lock No. 6, 3 cu. yds. being placed in highway culvert and 167 cu. yds. in snubbing-posts.

About 285 cu. yds. were excavated by hand from the spillway of Lock No. 4, material being placed as second-class embankment at south core wall of the lock. Some 465 cu. yds. of first-class embankment were placed along the core walls of Lock No. 5, material being obtained from spillway excavation and borrow-pit west of lock. About 100 cu. yds. were excavated from by-pass of Lock No. 4, in trimming slopes for wash wall and 635 cu. yds. of wall were built.

About 550 cu. yds. of lining were placed along south core wall of Lock No. 4. About 60 cu. yds. of material were removed from prism between Locks Nos. 5 and 6. Excavation above Lock No. 6 was by Vulcan shovel and by hand, about 3,100 cu. yds. being removed and placed in second-class embankment at north core walls of Locks Nos. 5 and 6, and south core wall of Lock No. 4. A small amount was spoiled below grade in prism above Lock No. 6. The Vulcan shovel was removed from the cut.

Contract No. 14.— For work from Contract No. 11 to a point near Rexford Flats aqueduct, including Lock No. 7 and Dams Nos. 2 and 3; also for constructing Locks Nos. 13, 14 and 15, Dams Nos. 9, 10 and 11, Mindenville retaining dam, etc.

At Dam No. 2, Crescent, the quarry and crusher were operated, forms were built and plant repaired. Teams and scrapers completed spoil bank between abutment and Contract No. 11. About 128 cu. yds. of first-class and 473 cu. yds. of second-class concrete were placed in the wide opening of Dam No. 2. High water caused considerable delay.

At Dam No. 3, Lock No. 7, Vischers Ferry, the walk was removed from the coffer-dam in south channel. Buildings and plant were moved from Harbor to below core wall. At the headgates, the old towpath, coffer-dams, etc., are nearly removed. Fenders on lock and approach walls were completed, except painting. Some 149 cu. yds. of first-class and 173 cu. yds. of second-class concrete were placed in south channel dam, closing all but three openings. About 1,000 lbs. of flash-board sockets and railing were placed on lock and dam and 314 lin. ft. of pipe-railing on the river wall of the lock. Some 300 cu. yds. were removed from prism below the lock. High water caused delay and prevented the removal of more rock.

At Rexford Flats, work continued with teams and a large force of men. About 1,000 cu. yds. were excavated and 290 cu. yds. of embankment formed. Some 2,300 lin. ft. of round timber and 10,000 ft. B. M. of yellow pine were used.

At Dam No. 9, Lock No. 13, Yosts, the coffer above the north span was removed by a dipper-dredge.

At Dam No. 10, Lock No. 14, Canajoharie, the sill was cleaned and gates and uprights tested. The riprap above the north span washed out in 1910 by reason of a break in the coffer-dam. It has been replaced. Spoil banks were leveled and filling placed behind all riprap.

At Dam No. 11, Lock No. 15, Fort Plain, the hydraulic dredge was transferred from Canajoharie and is removing the old coffer-dam below the lock.

Quantities: Excavation, 1,265 cu. yds.; embankment, 294 cu. yds.; concrete, 923 cu. yds.; dry stonework, 251 cu. yds.; sawed lumber, 14,680 ft. B. M.; round timber, 2,341 lin. ft.; iron and steel, 1,816 lbs.

Contract No. 14-A.— For clearing lands along the Mohawk river and removing buildings, from Crescent dam to Rexford Flats.

Contract work not yet begun.

Contract No. 20-D.— For dredging Mohawk river channel, constructing stream entrances, etc., between deep water below Rexford Flats aqueduct and center of bridge at Dam No. 9, at Yosts.

The hydraulic dredge *Amsterdam* continued prism excavation, placing about 67,388 cu. yds. in spoil back of Feltus island. The dipper-dredge excavated about 7,248 cu. yds. from prism. Material was removed by scows and spoiled where the hydraulic dredge had cut below bottom grade.

At Tribes Hill about 507 cu. yds. of material were placed in spoil above the lock.

At Danoscara creek some 18 cu. yds. of riprap were laid at stream entrance. High water prevented more being done at both these places.

The hydraulic dredge *Mohawk* also operated in prism, placing 224,670 cu. yds. in spoil on south side of the river and north of the Erie canal tow-path. A dipper-dredge passed through the lock at Yosts and excavated 4,000 cu. yds. for riprap.

Quantities: Excavation, 303,814 cu. yds.; riprap, 18 cu. yds.

Contract No. 8-A.— For constructing Dam No. 4 and Lock No. 8 at Scotia and other incidental work pertaining to the completion of the locks at Rotterdam and Cranesville.

At Dam No. 4, Lock No. 8, Scotia, work has progressed in caissons Nos. 16 to 22 inclusive, but rock has not yet been reached. Caisson No. 17, is the lowest. A wash-drill boring is being made in caisson No. 16 to determine the location of rock. Concrete has been placed to the amount of 1,361 cu. yds.

At Dam No. 5, Lock No. 9, Rotterdam, and Dam No. 6, Lock No. 10, Cranesville, no work was done.

Contract No. 17.— For constructing Dam No. 7 and Lock No. 11, at Amsterdam, and Dam No. 8 and Lock No. 12, at Tribes Hill.

Final estimates approved by Canal Board November 12, 1912.

Contract No. 20-C.— For dredging Mohawk river channel, constructing stream entrances, etc., between center of bridge at Dam No. 9, at Yosts, and center of bridge at Dam No. 10, at Canajoharie.

The dipper-dredge was variously employed. The old cofferdam above Dam No. 9, was removed and excavation made from prism and for riprap below the dam. On this contract its work was in cleaning the prism to grade and this has been practically completed. About 7,990 cu. yds. were removed at Spraker's rift and spoiled in deep water. The remainder included light prism excavation, removal of old pier in river bottom, cleaning up above lock at Yosts and removal of silt probably washed down from above Canajoharie dam. No work was done at Flat creek or Yatesville stream entrances. Quarrying continued and some stone for riprap were hauled.

Quantities: Excavation, 9,532 cu. yds.

Contract No. 86.— For the construction of one span of a highway bridge over the Mohawk river at Canajoharie, to replace two existing spans, which will be removed.

The north pier was graded and 75 per cent backfilled. At the south pier, steel sheet-piling was driven and braced and excavation nearly completed. For the new span, the falsework was placed in position, about 7 carloads of steel received and a traveler is being erected.

The piling and erection of the concrete pier will take several weeks to complete. The old span will be removed and the new span swung in a few days.

Quantities: Excavation, 491 cu. yds.

Contract No. 20-B.—For dredging Mohawk river channel, constructing stream entrances, etc., between the center of bridge at Dam No. 10, at Canajoharie, and the upper miter wall of the new lock at Mindenville.

The Lobnitz breaker continued work on ledge rock in prism, breaking about 2,090 cu. yds. of which 190 cu. yds. were removed by a dipper-dredge and spoiled on north side by an orange-peel dredge.

The two dipper-dredges continued feeding the hydraulic disposal boat most of the time. About 24,254 cu. yds. were excavated from prism and spoiled in channel behind Klock island. Because of the very light cut the location was changed and 2,732 cu. yds. were spoiled on the Miller area east of Caroga creek. About 3,874 cu. yds. were also taken from Caroga creek below the crest of the entrance structure.

Some 1,032 cu. yds. were excavated for cobblestone protection. About 493 cu. yds. were excavated at Otsquaga creek, grading around the entrance work. About 41 cu. yds. were also excavated for lining at Klock and Zimmerman creeks.

At Otsquaga creek the work has been closed for the winter, the remaining excavation to be done by dredges.

Contract No. 20-A.— For dredging Mohawk river channel, etc., between Castle creek and upper miter wall of lock at Little Falls.

The orange-peel bucket machine continued excavating in the west side of Castle creek, placing the earth removed in rear of tow-path on west side. Since November 16, the machine has been used as a derrick to remove stone from the feeder culvert for riprap. Some material was removed by wagons from the north side of the prism west of the guard-gates, to fill the north embankment to lines. Excavation for wash wall and riprap in the north embankment was partly completed. The hydraulic dredge continued excavation at the junction of the river and land line until November 8, when it was moved east to Castle creek. Some prism excavation to grade was done, but large cobbles delayed the work. All material was spoiled on south side.

Stone from the feeder prism were laid as riprap on the face of the north embankment. Two boats were transferred from the canal to the river for use in transporting stone.

Quantities: Excavation, 7,078 cu. yds.; embankment, 456 cu. yds.; riprap, 187 cu. yds.

Contract No. 31.— For improving the Erie canal at Little Falls, constructing Lock No. 17, and modifying the dam and constructing guard-gates at Rocky Rift.

The pipe-railing near the Adirondack Mill was painted.

Contract No. 30.— For dredging channel in Mohawk river and land line from Little Falls to Sterling creek, constructing Lock No. 18 at Jacksonburg, Dam No. 14 and guard-gates at Herkimer, retaining dam at Frankfort, bridges, etc.

West of Little Falls, the rock excavation was flooded during the entire month. The coffer-dam was again repaired and the site partly unwatered. The dredge *Herkimer* excavated from prism, stripped rock surface inside of coffer-dam and is now at work at site of Little Falls terminal and adjacent prism, removing in all, 42,000 cu. yds. of material.

From Lock No. 18 to Herkimer, wooden sheet-piling was driven for a distance of 553 feet. Tower No. 5 continued excavating from prism, placing material in north embankment. Tower No. 1 was equipped and added its output to the embankment. Wash wall was also placed at the embankment. Stone for wall and riprap were delivered at various points. Dikes were under construction on spoil area west of West Canada creek. Old slope wall is being removed from tow-path bank.

At the guard-gate, Herkimer, the north abutment and center pier, including work done by the railroad company, is completed. About 100 cu. yds. of concrete were laid in apron east of sill on north side, in place of riprap. About 25 per cent of the riprap above the sill on north side has been placed. The Mohawk street bridge was assembled and riveted. The masonry coping for the bridge was cut. The south concrete slab was placed. The U. & M. V. R. R. Co. have constructed a second detour, crossing the Erie canal on cribwork east of their bridge, so that the high trestle may be abandoned, etc.

At Dam No. 14, Herkimer, all concrete and riprap protection was placed in the bed of the river and about 65 per cent completed on the north side below the dam.

West of Herkimer, the dredge *Clinton* continued prism excavation, removing 100,000 cu. yds., mostly of coarse gravel and sand, to Kay and Mead spoil areas.

At Frankfort bridge, south pier, all concrete was placed and machinery is being moved to south abutment.

At East Schuyler bridge the south abutment was completed and partly backfilled. Work at the north abutment was begun.

Tower No. 4 continued filling the old river channel west of Frankfort.

Quantities: Excavation, 145,742 cu. yds.; embankment, 2,024 cu. yds.; concrete, 816 cu. yds.; wooden sheet-piling, 66,720 ft. B. M.; wash wall, 636 cu. yds.; riprap, 365 cu. yds.; structural steel, 105,500 lbs.; metal in guard-gates, 5,850 lbs.; reinforcement, 4,840 lbs.

Contract No. 29.— For excavating prism from Sterling creek to Oneida-Herkimer county line, constructing lock at Sterling creek, bridges, etc.

The total excavation was 1,065 cu. yds., of which 586 cu. yds. were from prism, 326 cu. yds. from wash wall notch and 153 cu. yds. from Day's culvert.

About 5,096 cu. yds. of embankment were formed, of which 3,429 cu. yds. were on north bank of prism, 1,514 cu. yds. at Burch culvert and 153 cu. yds. at Day's culvert. Some 81 lin. ft. of round timber bracing and 12 cu. yds. of lining, 1,312 lin. ft. of foundation piles, 184 cu. yds. of second-class concrete and 6,942 lbs. of reinforcement were used at the latter culvert.

At the lock, 2,700 ft. B. M. of white oak were used in miter sills and gates, 211 cu. yds. of concrete placed in lock invert and breast wall, 259 lbs. of steel used, 21,557 lbs. of metal placed in gates and 33,967 lbs. in buffer-beams.

About 340 cu. yds. of wash wall were built, of which 241 cu. yds. were at Harbor bridge and the remainder at West Schuyler bridge.

Day's culvert is about 40 per cent completed. Concrete at Lock No. 19 is complete. Operations on metal work are progressing satisfactorily. The north bank was completed through Sterling swamp and partly through Morrison swamp, with material taken from the north bank and under the bank west of Sterling creek.

Bad weather caused considerable delay.

Contract No. 42.— For prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillway, stream entrances, culverts, etc.

Contract canceled.

Contract No. 43.— For constructing the canal from a point just south of Oriskany road to about 1,500 feet west of Mud creek.

About an acre was cleared. The dredge *Stanwix* removed 105,673 cu. yds. and the cableway 4,000 cu. yds. of material. Some 2,684 ft. B. M. of sheeting and bracing were used at the west guard-gate and a like amount at the junction lock. At Mill street bridge 86 sq. yds. of paved gutter were laid.

Contract No. 44.— For constructing the canal from about 1,500 feet west of Mud creek, west of Rome, to about three miles west of New London, including junction lock, Locks Nos. 21 and 22, bridges, culverts, spillways, stream entrances, etc.

Some 21,840 cu. yds. of prism excavation were distributed as follows: Shovel No. 1347, 1,637 cu. yds.; shovel No. 841, 4,370 cu. yds.; tower No. 1, 7,060 cu. yds.; tower No. 3, 8,484 cu. yds.; derrick and teams, 289 cu. yds.

At Stoney brook bridge, 118, sq. yds. of stone paving and 916 cu. yds. of lining were laid. About 2 cu. yds. of masonry coping were also placed.

At Lock No. 21, 140 cu. yds. of concrete were laid in the lower north approach wall, using 55 lin. ft. of round timber for bracing. About 500 sq. ft. of steel sheet-piling were driven at the lower south approach. Some 67,233 lbs. of metal were used in lock-gates and 14,850 lbs. in buffer-dams.

At Lock No. 22, 1,594 cu. yds. of concrete were laid, 49 lbs. of structural steel and 249 lbs. of steel castings placed, 60 lbs. of metal used in lock-gates and 101 lbs. in buffer-beams.

Contract No. 12.— For excavating prism between Oneida lake and Mosquito Point bridge on Seneca river; constructing Lock No. 23 and other structures.

Dipper-dredge No. 6 operated in prism, removing about 47,000 cu. yds. of material. The drill-boat *Typhoon* also worked in prism.

At Lock No. 23, inside the coffer-dam, power-house foundations and lower approach walls were completed. Lock-gates were also completed and riprap placed at lower end of lock.

Dredge No. 1, operated in prism until November 27, when it was removed to Brewerton. Dredge No. 4, also excavated from prism until November 14, when it was taken nearly two miles further west where it is casting over material to be rehandled by dredge No. 1.

Dredge No. 5, finished cleaning up at Hickory island on November 14 and was transferred to Contract No. 5-A.

Quantities: Excavation, 102,558 cu. yds.; sheeting and bracing, 2,000 ft. B. M.; embankment, 2,542 cu. yds.; sawed lumber, 2,000 ft. B. M.; white oak in sills, 4,100 ft. B. M.; concrete, 999 cu. yds.; riprap, 62 cu. yds.; metal in lock-gates, 9,108 lbs.; in needle-dams, 2,232 lbs.; in valves, 778 lbs.; structural steel, 441 lbs.; reinforcement, 3,145 lbs.; iron castings, 323 lbs.

Contract No. 101.— For the construction of a steel highway bridge superstructure at Three River Point.

During the month about 60 cu. yds. of concrete were laid in north abutment and 200 cu. yds. of embankment placed behind it.

At the south abutment a coffer-dam was constructed, plant installed and material delivered.

Contract No. 22.— Bridges on Contract No. 12.

At Free bridge the concrete pier is completed. The north end of the superstructure was raised to required elevation and piles are being driven in the main portion of the north abutment. About 970 cu. yds. of embankment were placed in north approach and 90 cu. yds. of lining on south approach.

At Bonta's bridge, 353 cu. yds. of concrete were placed in south abutment. Steel for the new south span has been delivered.

Contract No. 57.— For constructing the canal through Onondaga lake outlet.

Work not yet begun.

Contract No. 22-A.— For constructing a new substructure, approach spans and approaches for a bridge over the Erie canal at Weedsport.

Work has not yet begun. Foundation piles are being delivered.

Contract No. 46.— For the construction of the canal from Fox Ridge to the southeast corner of the town of Galen, including Lock No. 25, a movable dam at May's Point, bridges, etc.

At Lock No. 25, 14,472 lin. ft. of round piles, each 15 to 30 ft. long, were driven and 646 cu. yds. of concrete placed in the southwest approach wall and 472 cu. yds. in the southeast approach wall. About 480 sq. ft. of steel sheet-piling were driven at lock walls.

At the County Line bridge, 769 cu. yds. were excavated from borrow-pit and placed in approaches and 165 cu. yds. of embankment formed. Some 2,125 lin. ft. of piles were driven in foundation for east abutment.

At the movable dam, about 625 cu. yds. of embankment were placed back of north and south abutments.

Contract No. 47.— For the construction of the canal from the southeast corner of the town of Galen to a point near the N. Y. C. & H. R. railway crossing at Lyons, including Lock No. 26, a dam across the Clyde river, highway bridge, stream entrance, etc.

No contract work was done.

Contract No. 5-A.— For the completion of Contract No. 5, from Mosquito Point to Campbell's bridge, including construction of Owasco creek entrance, reconstruction of bridge at Mosquito Point and new pier and approaches at Howland's island bridge, etc.

At Howland's island bridge, the embankment at south approach was completed and the guard-fence built and painted one coat.

At Owasco creek dam, the timber cribs were placed and filled with stone. Some 100 cu. yds. of riprap were placed below the structure.

At Mosquito Point bridge, dredge No. 5 formed slopes in front of the abutments. The riprap at the north abutment is nearly completed.

Quantities: Excavation, 14,067 cu. yds.; embankment, 1,578 cu. yds.; lining, 90 cu. yds.; round timber in cribs, 5,076 lin. ft.; stone filling, 711 cu. yds.; riprap, 225 cu. yds.; fencing, 528 lin. ft.

Contract No. 89.— For the construction of five superstructures and one substructure for highway bridges between Lyons and Palmyra on Contracts Nos. 48, 76 and 77.

At Forgham street bridge, Lyons, 1,806 lin. ft. of foundation piles were driven and 26 cu. yds. of concrete placed in the substructure. Some 416 cu. yds. were excavated and 142 cu. yds. of embankment formed.

Contract No. 48.— For the construction of the canal from a point near the N. Y. C. & H. R. railway crossing at Lyons to a point near the West Shore railway crossing at East Newark, including Locks Nos. 27 and 28-A, dam and power-house, reten-

tion dam across Canandaigua outlet, spillway, culverts, highway, bridge, approaches, etc.

At Geneva street, approaches and paving were completed and bridge opened to traffic November 25.

At Lock No. 27, 7,250 sq. ft. of steel sheet-piling were driven at lower approach, 18,100 ft. B. M. of sheeting and bracing used in coffer-dam and 435 cu. yds. of second-class concrete placed.

At Lock No. 28-A, the embankment for the upper approach wall and backfill for south lock wall are nearly completed. About 1,936 cu. yds. of second-class concrete were placed in the north wall.

At the west end of the contract the Browning crane excavated 11,700 cu. yds. and 488 cu. yds. of wash wall were placed.

Contract No. 76.— For the construction of the canal from a point near the West Shore railway crossing at East Newark to a point about one-half mile east of Port Gibson.

Installation of plant for winter work was rushed. Three steam-shovels are already at work. Two more are to be installed.

Shovel No. 1 removed 5,758 cu. yds. from the prism and upper approach of Lock No. 28-B. Shovel No. 24, working east of the lock, removed 5,407 cu. yds. Shovel No. 20, near the west end, excavated 28,581 cu. yds.

At the upper approach of the lock, 511 cu. yds. of concrete were placed.

At East avenue bridge abutment, 121 cu. yds. of concrete were laid.

Contract No. 77.— For constructing the canal from one-half mile east of Port Gibson to one-half mile west of Palmyra, including Lock No. 29, power-plant, bridges, culverts, etc.

At the east end of the contract, the dredge *Palmyra* removed 71,542 cu. yds. of material. About 24,391 cu. yds. of embankment were formed with material taken from Contract No. 76.

At Lock No. 29, 321 cu. yds. of concrete were placed in the lock and 186 cu. yds. at the upper approach wall. Steam-shovel No. 21 removed 4,032 cu. yds. of material from the upper approach.

At the power-house 35 cu. yds. of concrete were laid.

Contract No. 49.— For prism construction from a point about 500 ft. east of Yellow Mills bridge, about one mile west of Pal-

myra, to the Monroe county line, including Lock No. 30, sluice-gates, highway bridges, culverts, etc.

The dredge *Fairport* removed 27,417 cu. yds. and the McMyler excavator 3,190 cu. yds. from prism.

At Lock No. 30, 674 cu. yds. of concrete were placed in the lower approach wall and 18 cu. yds. in the lock.

About 102 cu. yds. of wash wall were built. Work on the smaller items is progressing.

Contract No. 63.—For enlarging present canal and constructing culverts, sluiceways, waste-weir, guard-gates, dock walls, bridges, highway changes, etc., between Wayne-Monroe county line and Kings Bend.

The dredge *Fairport* continued operating in the cut-off, completing the new prism from Main street to a point 500 feet east of Fullham's basin bridge. Material was spoiled on adjacent Schummers area. Two steam-shovels have recently begun excavating prism west of Bushnell's basin and also west of Pittsford. Material was mostly spoiled. At Knapps bridge material was taken from borrow-pit for approaches. Material was also excavated from wash wall notches, at Fairport waste-weir, for abutments at Wiltsie's bridge and for grading tow-path.

Considerable lining was placed on tow-path. Paving was done at abutments of Monroe avenue, Mitchell's and Bushnell's basin bridges. Wash wall was built and coping placed.

Cartersville bridge was completed and flooring laid. Flooring was also laid at Fullham's basin bridge. Pipe-railing is being placed on approaches to Main street, Pittsford, bridge. At Fairport waste-weir riprap was placed at the outlet ditch and the old John street culvert was removed. Most of the steam-shovel plant has been removed to Fairport for use in excavating prism this winter.

Stone for wash wall and paving were delivered and gravel for concrete was hauled to the guard-gate at Bushnell's basin.

Quantities: Excavation, 48,143 cu. yds.; embankment, 5,587 cu. yds.; lining, 162 cu. yds.; wash wall, 819 cu. yds.; paving, 303 sq. yds.; riprap, 140 cu. yds.; pipe-railing, 315 lin. ft.; sawed lumber, 30,840 ft. B. M.

Contract No. 23.—For prism excavation between Kings Bend and Genesee river, and construction of Locks Nos. 32 and 33, guard-lock, bridges, culverts, etc.

Steam-shovel No. 692 completed its work east of lock No. 32 and was withdrawn from service. Shovel No. 938 began work west of lock No. 33, cleaning prism to grade and spoiling output north of north dike. Shovels Nos. 1178 and 2449 continued prism excavation between Westfall road and the L. V. R. R. crossing, disposing of material in approaches to Clinton avenue bridge and adjacent north and south embankments and on Hillside avenue approach to South avenue bridge.

Excavating by hand was done for wash wall in various places and for stone protection work in vicinity of Locks Nos. 32 and 33, for foot-bridge foundations at lock No. 33, and for snubbing-posts near Lock No. 32. The Browning crane trimmed slopes near Lock No. 32, spoiling material in rear.

Second-class concrete was placed in setting snubbing-posts, and at the upper spillway and upper guide-wall of Lock No. 33. Foundations and piers of foot-bridge at this lock were also concreted.

Considerable wash wall was built, third-class paving laid under approach slabs at Kingsley road bridge and riprap placed around spillways and by-passes of both locks.

At Lock No. 32, the concrete storehouse was built to the plates and the roof is under construction. Pipe-railing was placed on the foot-bridge.

West Henrietta road bridge was riveted, flooring is being laid and painting is in progress. The south approach at Clinton avenue bridge is built and nearly all the lining placed.

Large quantities of stone, sand and gravel were received.

Quantities: Excavation, 34,004 cu. yds.; embankment, 8,427 cu. yds.; lining, 314 cu. yds.; concrete, 280 cu. yds.; wash wall, 1,221 cu. yds.; riprap, 1,777 cu. yds.; paving, 119 sq. yds.; sawed lumber, 35,714 ft. B. M.; structural steel, 38,706 lbs.; iron castings, 1,200 lbs.; pipe-railing, 70 lin. ft.

Contract No. 21.— For prism excavation and construction of bridge abutments, guard-lock, etc., from the Genesee river west 2.56 miles to a point just west of the N. Y. C. & H. R. railway crossing.

Pumping for drainage continued at several places, as necessity required.

Shovel No. 3 continued excavating in rock and shovel No. 4 in earth at the west end of the contract, material being spoiled, except some rock which was crushed for concrete.

The locomotive crane was used part of the time in clearing a bench for the channeling machines and the remainder of the time in loading loose rock in prism for the crusher at guard-lock.

At the guard-lock placing concrete continued. The roadway to lock level was graded, walls backfilled and snubbing-posts set. Seven steam-drills were employed ahead of shovel No. 3. Four or five channelers were also used in cutting rock to prism lines. At the B. R. & P. R. R. crossing, the new bridge is completed and the tracks are being laid upon it.

Quantities: Excavation, 43,733 cu. yds.; concrete, 359 cu. yds.; lining, 9 cu. yds.; channeling, 4,255 sq. ft.; iron castings, 3,600 lbs.

Contract No. 82.— For furnishing and erecting three steel highwas bridge superstructures on Contract No. 21, near Rochester.

No contract work was done.

Contract No. 75.— For construction of three guard-gate superstructures on Contracts No. 60, 61 and 64.

No contract work was done.

Contract No. 105.— For the construction of five lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Union street, Spencerport; Washington street, Adams Basin; Park avenue, Brockport; Hulberton; Gasport.

At Washington street bridge, Adams Basin, the superstructure was riveted and concrete counterweights made. The operator's cabin is nearly completed. The bridge floor is being laid and operating machinery installed.

At Union street bridge, Spencerport, some gravel was delivered. Teams are excavating north and south pits.

At Park avenue bridge, Brockport, work was resumed November 18. Teams began excavating on north and south sides. On the north side, material was used for adjacent embankment. On the south side, concreting retaining wall began as soon as water was drawn from the canal. The old highway bridge was removed and a temporary foot-bridge erected.

At Hulberton bridge, 924 cu. yds. were excavated from east and west wings of well and for north well. Some 95 cu. yds. of concrete were placed in west wing of south well. The mixer was moved to the north side.

At Gasport bridge, on south side, 382 cu. yds. were excavated from abutment by hand labor and derrick. Some 327 cu. yds. of

reinforced concrete were placed, using 540 lbs. of structural steel and 14,454 lbs. of reinforcement.

Drag-scrapers removed 154 cu. yds. of earth from north abutment and prism.

Quantities: Excavation, 3,402 cu. yds.; embankment, 858 cu. yds.; second-class concrete, 211 cu. yds.; reinforced concrete, 403 cu. yds.; sheeting and bracing, 3,585 ft. B. M.; sawed lumber, 17,529 ft. B. M.; reinforcement, 23,457 lbs.; machinery, 20,000 lbs.; structural steel, 21,157 lbs.

Contract No. 60.— For prism excavation and construction of culverts, bridge structures, etc., between a point 1.75 miles east of South Greece and a point 0.5 mile west of Adam Basin.

At culverts Nos. 53 and 54, paving was laid at north ends. At culvert No. 45 the north and south end extentions are being excavated, to remove and replace disintegrated concrete. At the guard-gate paving is being laid. Isolated snubbing-posts were set. The fencing on the north approach of bridge No. 95 was painted.

Considerable work was done in trimming slopes, filling out embankment to lines, placing wash wall, leveling puddle placed on bottom of prism by scows during navagation season and placing lining on tow-path. All of this work is in scattered locations and is the final cleaning up of the contract before completion.

Quantities: Excavation, 4,349 cu. yds.; embankment, 1,700 cu. yds.; lining, 424 cu. yds.; wash wall, 942 cu. yds.; paving, 89 sq. yds.

Contract No. 61.— For prism excavation and construction of culverts, bridges, waste-weir, etc., between a point 0.5 mile west of Adams Basin and Monroe-Orleans county line.

Excavator No. 1 completed removal of old berme bank east of guard-gate on November 1, and idle for about three weeks, beginning again on November 25, working from Brockport westerly, cleaning up the bottom of prism and using material to build up low banks. Excavator No. 2, worked the entire month making embankment and cleaning up bottom of prism. Excavator No. 3 was idle. Two derricks were erected for use in rock excavation with hand labor and skips.

Considerable wash wall was built, banks trimmed and graded and tow-path lined. Board sidewalks were laid in Clinton street.

The highway change between bridges Nos. 111 and 112 is progressing, surplus material being used for embankment on Contract No. 62, adjacent.

Quantities: . Excavation, 3,485 cu. yds.; embankment, 39,962 cu. yds.; lining, 1,129 cu. yds.; wash wall, 413 cu. yds.

Contract No. 62.— For prism excavation and construction of culverts, bridge substructures, etc., between Orleans-Monroe county line and a point near Eagle Harbor bridge.

Albion section:

About 54,351 cu. yds. were excavated, by the Bucyrus excavator with drag line east of culvert No. 74, Brown traveling crane east of culvert No. 73, Bucyrus excavator with drag line west of bridge No. 124, clam-shell derrick east of bridge No. 120, Lidgerwood excavator west of culvert No. 82, in removal of old vertical walls on tow-path at bridge No. 120 and at Albion.

About 7,051 cu. yds. of embankment were formed, by Brown crane west of culvert No. 72, teams and scrapers on tow-path east of culvert No. 74, Bucyrus outfit on berme side east of culvert No. 74, and by teams and scrapers east of Lattin's bridge and west of bridge No. 124.

About 973 cu. yds. of wash wall were built on bermes east of Eagle Harbor and east of bridge No. 125.

Other work was in building approaches at bridges Nos. 124, 126 and 129, painting steel of Gaines bridge, erecting temporary bridges at Albion and delivery of gravel at Hindsburg, Albion, Eagle Harbor and culverts Nos. 73 and 74.

Holley section:

About 22,215 cu. yds. were excavated, by steam-shovel and McMyler excavator at Holley trough, Koppel car-plant at borrow-pit east of Holley waste-weir, teams at Ford's borrow-pit, in prism east of Tuttle's bridge and Hulberton bridge and by hand at Squires dock wall.

About 387 cu. yds. embankment were formed west of Hulberton and east of Tuttle's bridges.

Forms were built at bridges Nos. 112 and 116, gravel delivered at Holley trough, lining placed on tow-path and wash wall built on tow-path east of McGuire's bridge and on berme near Tuttle's bridge.

Quantities: Excavation, 76,566 cu. yds.; embankment, 14,887 cu. yds.; dry stonework, 3,042 cu. yds.

Contract No. 64.— For improvement from 600 ft. west of Prospect street, Medina, to 100 ft. east of Gasport bridge.

About 33,270 cu. yds. were excavated, comprising 770 cu. yds. grubbed, drilling and blasting through Middleport and trimming

slopes, and including the output of the dredges *Empire* and *Peconic*. Some 600 cu. yds. of embankment were formed, 732 cu. yds. of lining placed on tow-path and 560 cu. yds. of wash wall built between Middleport and Gasport.

Contract No. 66.— For prism excavation and constructing bridges and approaches, culverts, etc., from 100 ft. east of Gasport bridge to 600 ft. east of Lockport locks.

The ladder dredge *Mineola* removed 2,778 cu. yds. of material from prism, which completed all excavation except trimming. The dredge is being dismantled at Gasport.

Some 67 sq. yds. of paving and 11 cu. yds. of lining completed culverts Nos. 119 and 121. The final cleaning up is progressing.

Contract No. 67.— For construction of Locks Nos. 34 and 35 and approaches, etc., at Lockport.

At Main street bridge, 1,526 cu. yds. were excavated from prism by a Bucyrus shovel. Some 14,952 lbs. of structural steel were placed in the bridge.

At Lock No. 34, 1,068 cu. yds. of concrete were laid in the north thrust-wall and upper miter-sill.

At Lock No. 35, about 213 lin. ft. of 6-in. vitrified pipe were laid along the south wall.

Contract No. 40.— For constructing the canal, culvert entrances, guard-gates, stream entrances, bridges, etc., from the Lockport locks to Sulphur Springs guard-lock.

The total excavation was 2,488 cu. yds. of which 1,698 cu. yds. were removed from prism by the cantilever east of Hawley's bridge, 390 cu. yds. were excavated by hand for retaining wall on berme side at Hinman and 400 cu. yds. by Browning excavator and steam-shovel west of Hawley's bridge.

About 131 cu. yds. of concrete were placed, most of which was at Hinman wall. Some 64 cu. yds. of wash wall were built along the tow-path between Hinman and Hawley's bridge. About 4,800 lbs. of iron castings in snubbing-posts were set.

Contract No. 19.— For prism excavation, rebuilding bridges, constructing masonry culvert, concrete-capped pile docking, etc., between Sulphur Springs guard-lock and mouth of Ellicott creek.

The total excavation for the month was 29.827 cu. yds., of which 29,430 cu. yds. were removed by the hydraulic dredge

Niagara, on double shifts, and 397 cu. yds. were removed from ditches by hand.

The dipper-dredge *Buffalo,* on double shifts, excavated 2,617 cu. yds. which were spoiled in prism, to be rehandled by the *Niagara.*

At Martinsville dock, repairs were completed early in the month.

Champlain Canal.

Contract No. 70.— For dredging a channel in the Hudson river from outlet of Barge canal at Waterford to Lock No. 1.

Contract canceled.

Contract No. 70-A.— For the completion of the work remaining to be done on Contract No. 70.

Recently awarded. Work not yet begun.

Contract No. 71.— For constructing Lock No. 1 and Dam No. 1, above Waterford, and dredging Hudson river from Lock No. 1 to lower Mechanicville lock.

Contract canceled.

Contract No. 69.— For constructing Lock No. 2, at lower Mechanicville.

The concrete in the upper guide-wall, except two blocks, was laid. Forms were removed from wheel-pits. Rubbing concrete surfaces is in progress. About 740 cu. yds. were laid.

Rock is being stripped in the upper prism, material being spoiled behind upper retaining wall and upper east thrust-wall. Two drills are at work. About 1,100 lin. ft. were penetrated.

The steel derrick was placed to excavate for the remaining blocks of the guide-wall. Track was laid back of retaining wall to handle excavated material.

Walks were built on gates and painted with carbolineum. Half of the stop-logs for wheel-pits are finished.

Contract No. 72.— For dredging Hudson river from lower Mechanicville to Stillwater.

Contract canceled.

Contract No. 88.— For the construction of a steel highway bridge at Schuylerville, within the limits of Contract No. 73.

After the flooding of the east coffer-dam on October 24, slow progress was made in unwatering it. The water receded on

November 20, sufficiently to allow the work to progress. Concreting began and 375 cu. yds. were placed.

Contract No. 1.— For dredging Hudson river from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; constructing Crocker's Reef dam and approaches to "Land Line," etc.

Work closed down indefinitely.

Contract No. 24.— For constructing guard-gate at Crocker's Reef.

Prism excavation is completed, except dike at north end. Embankment is practically completed. Wash wall and coping finished. Concrete finished except counterweights, which cannot be made until towers are erected. White oak sill placed. Steel has not arrived.

Quantities: Excavation, 909 cu. yds.; embankment, 635 cu. yds.; concrete, 12 cu. yds.; wash wall, 244 cu. yds.

Contract No. 54.— For constructing Lock No. 7, at Fort Edward.

About 2,800 cu. yds. of material were taken from borrow-pit on Contract No. 27-A and 400 cu. yds. were rehandled from spoil bank back of lock. All of this was placed back of east wall of lock. High water delayed the work.

About 60 cu. yds. of concrete were used in setting snubbing-posts along the upper approach wall. Some 458 lin. ft. of pipe-railing were placed on west lock wall.

Contract No. 27-A.— For completing the construction of the canal between the Hudson river at Fort Edward and the south end of Contract No. 25, at Dunhams Basin road.

About 193 cu. yds. were excavated from spoil banks on west side, near Dunhams Basin. Some 700 cu. yds. were excavated from wash wall notch, 49 cu. yds. from siphon spillway at north end, 2,800 cu. yds. from prism at south end of contract and 200 cu. yds. from west abutment at East street bridge.

For a distance of 700 lin. ft. south of East street, triple-lap sheet-piling was driven at the west embankment. About 500 cu. yds. of concrete were placed in the East street bridge abutments and at siphon spillway, completing the latter. Some 554 cu. yds. of wash wall were built on prism slopes. About 25 sq. yds. of

second-class paving were laid at siphon spillway. About 1,920 lin. ft. of piles completed this work at the foundation of East street bridge.

The temporary bridge for crossing the canal at Argyle street is nearly completed. The steel sheet-piling coffer-dam was placed at the upper end of Lock No. 7.

Quantities: Excavation, 4,251 cu. yds.; embankment, 52 cu. yds.; concrete, 522 cu. yds.; dry stonework, 554 cu. yds.; sawed lumber, 64,134 ft. B. M.; round piles, 96 lin. ft.; iron and steel, 825 lbs.

Contract No. 25.— For prism excavation between a point 0.6 mile north of Comstock post-office and highway crossing at Dunhams Basin; constructing Lock No. 9, spillways, power-plant, etc.

Excavating at rock cuts, at Dunhams Basin and at the by-pass of Lock No. 9, finished. Embankment, lining and concrete work at Comstock bridge completed. Wash wall throughout contract completed. Wooden fencing placed at Smith basin, Comstock and Brayton's bridges. Comstock bridge was opened for traffic November 12.

Quantities: Excavation, 20,977 cu. yds.; embankment, 699 cu. yds.; concrete, 69 cu. yds.; dry stonework, 876 cu. yds.

The contract is practically completed.

Oswego Canal.

Contract No. 39.— For dredging channel in Oswego river, constructing stream entrances, excavating through Hinmansville cut-off, etc., between Three River Point and Fulton, except portion covered by Contract No. 53.

Excavation for the month amounted to 34,214 cu. yds.

Contract No. 85.— For constructing a steel bridge over the lock at Phœnix.

Contract finished. Final estimates being prepared.

Contract No. 80.— For constructing a concrete dam across the Oswego river at Phoenix.

Final estimates approved by Canal Board October 22, 1912.

Contract No. 104.— For the construction of a reinforced concrete arch bridge over the Barge canal at Broadway, Fulton.

No contract work was done.

Contract No. 10-A.— For completing the construction of the canal, raising the upper dam, etc., from Broadway bridge, Fulton, south to Contract No. 39.

At the Taintor gates, about 125 cu. yds. of material were excavated, 15,406 lbs. of metal used in needle-beams, and 240 cu. yds. of first-class concrete placed, of which 221 cu. yds. were in west abutment and 19 cu. yds. in the upper dam.

Contract No. 10-B.— For completing the construction of the canal from the upper end of Lock No. 2, Fulton, north to Contract No. 37.

At the retaining wall between Locks Nos. 2 and 3, 364 cu. yds. of material were excavated, 403 cu. yds. of second-class concrete and 287 lbs. of structural steel placed, and 3,250 ft. B. M. of sheeting and bracing used, of which 2,800 ft. B. M. were reused material.

At Lock No. 3, 701 cu. yds. of material were removed, 3,564 cu. yds. of second-class concrete, 5,880 lbs. of plain iron castings and 300 lbs. of structural steel used. In the lower west approach wall, 59 cu. yds of concrete and 143 lbs. of structural steel were placed.

In the retaining wall west of Lock No. 3, 478 cu. yds. of concrete were laid.

In the prism below Lock No. 3, 4,555 cu. yds. of material were removed and on the east side 890 sq. ft. rock surface were formed by line drilling instead of channeling.

Contract No. 37.— For dredging a channel in Oswego river, constructing Locks Nos. 5 and 6, dams, bulkheads and other structures, and the removal of Battle Island and High dams, between Contract No. 10, at Fulton, and Contract No. 35, at Oswego.

Excavation was 21,811 cu. yds., of which 8,711 cu. yds. were from Contract No. 10 to Lock No. 5, 7,984 cu. yds. between Locks Nos. 5 and 6, 214 cu. yds. below Lock No. 6, 57 cu. yds. from Minetto wall and dike, 3,492 cu. yds. from Lock No. 5, 991 cu. yds. from bulkhead No. 6, 196 cu. yds. from the upper and 166 cu. yds. from the lower guide-walls of lock No. 6. Under Alteration No. 7, 1,193 cu. yds. were removed.

At Lock No. 5, 3,298 cu. yds. of second-class concrete were laid, 537 lbs. of structural steel, 911 lbs. of reinforcement and 1,940 lbs. of machined castings used, 110 lbs. of metal placed in gates and 952 lbs. in buffer-beams.

At Minetto retaining wall and dike, 413 cu. yds. of concrete were placed, using 1,092 lbs. of reinforcement. About 35 lin. ft. of the bolt-holes were drilled in rock.

At bulkhead No. 5, 268 cu. yds. of concrete were laid, 1,862 lbs. of structural steel placed, 2,017 lbs. of reinforcement and 7,653 lbs. of machined castings used.

At bulkhead No. 6, 81 cu. yds. of embankment were formed.

Quantities: Embankment, 81 cu. yds.; concrete, 3,980 cu. yds.; iron and steel, 16,013 lbs.

Contract No. 35.— For prism excavation and constructing Locks Nos. 7 and 8, bulkheads, culverts, spillways, etc., between a point one-half mile above Utica street bridge and harbor line north of Bridge street, at Oswego.

About 542 cu. yds. were excavated, of which 288 cu. yds. were at the hydraulic bulkhead and the balance from prism. Some progress was made in placing gate-hoists.

Cayuga and Seneca Canal.

Contract A.— For constructing Lock No. 1 and Dam No. 1, near Cayuga.

About 1,164 cu. yds. were excavated and 1,021 cu. yds. of concrete laid in the lock, lower approach wall and retention dam. Some 84 lin. ft. of piles were driven at the lower approach wall. About 1,548 lbs. of metal were placed at the dam.

Contract B.— For excavating a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from Cayuga lake to Seneca Falls and from Waterloo to deep water in Seneca lake.

The dredge continued working on the west curve of the Y, with a small amount on the east curve. It was then moved back and worked toward the south about 700 feet, dredging the lower half of the prism section. Except for a short distance on the east curve of the Y, the prism is dredged to its full section for a distance of two and a half miles from the north end of the contract.

About 200 20-ft. lengths of steel sheet-piling were driven across the Free bridge road, for protection when dredging a channel through the road.

Quantities: Excavation, 90,998 cu. yds.

Contract H.— For excavating a channel in Cayuga lake inlet at Ithaca from a point about 300 feet north of Cascadilla street, to deep water in Cayuga lake.

The dredge *Ithaca* removed about 103,332 cu. yds. of material from prism. About 3,200 lin. ft. of spoil dikes were built. At the turning basin near the Cornell boat house, 737 cu. yds. of material were removed by teams and scrapers and deposited in the old slip where the boat house is to be placed. About 120,000 ft. B. M. of sawed lumber were framed in cribs for the new breakwater, but they were not sunk in position.

A canal boat is being fitted with a tower and concrete plant for use in constructing the breakwater.

Contract I.— For improving the canal from deep water in Seneca lake to Montour Falls, about 2.75 miles.

Plant is being unloaded from cars and boats and assembled. Office and shop are being constructed. A derrick was erected for building the hull of a dredge.

Water-Supply.

Contract No. 50.— For constructing dam, waste-gates and spillway across West Canada creek at Hinckley.

Excavation of rock along the spillway on the north side of the creek continued, except when the coffer-dam was flooded. A small amount was excavated at south wall of spillway.

Embankment forming on west side of core wall continued until November 25, when the depth of snow compelled suspension of the work.

Concrete was placed in the upper gate-chamber, south gate-chamber intake, apron at toe of spillway and at end of outlet pipes in spillway. Cyclopean masonry was laid in north abutment, spillway sections 2, 3, 4 and 6 and in masonry dam north of spillway.

Quantities: Excavation, 1,793 cu. yds.; embankment, 12,046 cu. yds.; concrete, 607 cu. yds.; Cyclopean masonry, 2,381 cu. yds.; reinforcement, 153 lbs.; plain castings, 7,200 lbs.; machined castings, 3,472 lbs.; bolt-holes, 115 lin. ft.; line drilling, 1,854 sq. ft.

Contract No. 51.— For constructing a canal feeder from Trenton Falls on West Canada creek to Nine-Mile creek below South Trenton, with gate-house, culverts, highway, etc.

Excavator "K" was in operation for a few days. On November 18, the traveling derricks were laid off and excavation ceased, except with a few teams. Machinery has been overhauled, painted and housed.

Quantities: Excavation, 3,346 cu. yds.; cobblestone paving, 32 cu. yds.; wooden fence, 188 lin. ft.; pipe-railing, 18 lin. ft.

Contract No. 55.— For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black River canal, with four locks and aqueduct over Mohawk river, highway change, bridges, etc.

Final estimates being prepared.

Contract No. 55-A.—For constructing dwelling and shelter for lock-tenders at Delta dam.

By a resolution of the Canal Board, this work is being done under authority of the Department of Public Works. The Contract will therefore not appear again.

Contract No. 55-R.— For the removal of bodies from cemeteries located within the flooded area of Contract No. 55, Delta reservoir, to a new cemetery outside the flow lines.

Final estimates approved by Canal Board.

Contract No. 56.— Glens Falls feeder.

About 5,700 cu. yds. of material were excavated from the Dunhams Basin ditch and for embankment. For new by-pass structures at Locks 2, 4, 5 and 13, 2,300 cu. yds. were excavated. At the Glens Falls feeder dam, north bulkhead, a derrick and concrete plant were set up and 370 cu. yds. excavated. About 1,500 cu. yds. were taken from borrow-pits to grade approaches to bridges 17, 10, 11 and 11-A.

Some 115 cu. yds. of concrete completed the north abutment to bridge 7. About 73 sq. yds. of stone paving were placed at the D. & H. R. R. bridge over Bond creek at Dunham's Basin.

Power-Supply.

Contract No. 91.— For building and equipping a hydro-electric power-plant on the Erie canal near the east end of Crescent dam.

At the power-house, the cinder concrete was placed on the roof, crane-rail and crane installed. Windows and frames were set and frames and trash-rack painted. Grading around power-house progressed.

Contract No. 90.— For constructing hydro-electric power-plants at Baldwinsville on the Erie canal, and at Smiths, Comstock and Whitehall on the Champlain canal. Also for constructing equipment for operating and lighting the following locks: No. 24, Erie canal; Nos. 1, 2, 7 and 8, Oswego canal; Nos. 9, 11 and 12, Champlain canal.

On the Oswego canal, at Lock No. 7, 186 lbs. of metal ducts, 556 lbs. of insulated conductor and 1 lamp-pole were delivered.

At Lock No. 8, 215 lbs. of insulated conductor and 2 lamp-poles were delivered.

Contract No. 90-A.— For constructing hydro-electric power-plants, substations and equipments to complete installations at Locks Nos. 1, 2, 7 and 8, Oswego canal.

At Lock No. 1, 81 cu. yds. of embankment were formed. About 958 ft. B. M. of sheeting and bracing and 80 lbs. of structural steel were used.

At Lock No. 2, about 8 cu. yds. of embankment were formed.

Progress of Plans Being Prepared.

The following pages contain detailed accounts of the plans in process of preparation at the main and residency offices, showing progress up to the first of December. An order according to location is followed, as explained in the account of contract work for the month.

Erie Canal.

Contract No. 110.— For constructing steel highway bridges at James and Lawrence streets, Rome, within Contract No. 43. Plans 30 per cent completed.

Contract No. 100.— For constructing four steel highway bridges, as follows: Over the Seneca river, at Belgium, within Contract No. 12; over the Erie canal, at Long Branch, within Contract No. 57; over the Oswego river, at Hinmanville, within Contract No. 39 and at Minetto, within Contract No. 37. Plans 10 per cent completed.

Contract No. 84.— For the construction of two steel lift bridges at Clyde, within Contract No. 47. Work on plans suspended, pending an investigation as to elimination of grade crossing.

Contract No. 108.— For constructing a steel highway bridge at Macedon, within Contract No. 48 and superstructures for steel highway bridges at Peek's and Allerton's, within Contract No. 76. Plans 25 per cent completed.

Contract No. 59.— For constructing a movable dam in the Genesee river at Rochester. Plans 90 per cent completed.

Contract No. 106.— For the construction of four lift-bridges over the Erie canal, and all appertaining construction, at the following locations: Exchange street, Lockport; Middleport; Prospect street, Medina; Main street, Brockport. Plans 96 per cent completed.

CAYUGA AND SENECA CANAL.

Contract D.— For excavating a channel in Seneca river from the vicinity of Demont's bridge through the village of Waterloo. Plans completed.

POWER-SUPPLY.

Contract No. 93.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 20, 21, 22, 23 and 25, Erie canal; Locks Nos. 3, 5 and 6, Oswego canal; Locks Nos. 1, 2, 3 and 4, Cayuga and Seneca canal. Plans 10 per cent completed.

Plans before Canal Board.

Contract No. 115.— For deepening the chamber of the sloop-lock and its lower approach, at Troy dam.

In view of the contemplated opening to navigation of a section of the Barge canal between Rexford Flats and the Hudson river at Waterford in the spring of 1913, it becomes necessary to have the work described completed before high water interferes.

The Canal Board, therefore, by resolution on October 22, instructed the Department of Public Works to proceed directly with the work. This Contract will therefore not appear again.

Contract No. 74.— For dredging Mohawk river from Hudson river to Contract No. 2-E. Advertised for November 12, 1912. No bids were received.

Contract No. 18-A.— For completing the construction of the canal from Mindenville to Castle creek. Plans approved by Canal Board November 12, 1912.

Contract No. 87.— For constructing a bridge over the Erie canal near Rocky Rift dam, within Contract No. 20-A. Plans approved by Canal Board November 12, 1912.

Contract No. 107.— For constructing a steel lift-bridge at Little Falls, within Contract No. 31. Plans approved by Canal Board November 26, 1912.

Contract No. 42-A.— For completing prism excavation between Herkimer-Oneida county line and Oriskany road, and construction of Lock No. 20, bridges, spillway, stream entrances, culverts, etc. Plans approved by Canal Board November 26, 1912.

Contract No. 102.— For constructing a steel highway bridge over the Erie canal at Howland's island, within Contract No. 5-A. Plans approved by Canal Board November 12, 1912.

Contract No. 65.— For work from the west end of Contract No. 9, at a point near Beal's bridge, to the east end of Contract No. 64, at a point 600 feet west of Prospect street, Medina, including Oak Orchard creek crossing. Plans approved by Canal Board November 26, 1912.

Contracts Advertised.

Contract C.— For constructing locks, dam, etc., at Seneca Falls. Engineer's estimate, $1,140,872.50. Length, 1.1 miles. Drawings, 34 sheets. Time limit for completion, 36 months. Plans approved by Canal Board November 12, 1912. Advertised. Bids opened December 31, 1912.

Contract E.— For constructing a lock, dam, etc., at Waterloo. Engineer's estimate, $319,666.550. Length, 0.21 mile. Drawings, 24 sheets. Time limit for completion, 24 months. Plans approved by Canal Board November 12, 1912. Advertised. Bids opened December 31, 1912.

Contract No. 92.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 2 to 19,

inclusive, on the Erie canal, and Locks Nos. 1 to 8, inclusive, on the Champlain canal. Engineer's estimate, $1,245,660. Drawings, 107 sheets. To be completed by May 1, 1915. Plans approved by Canal Board November 26, 1912. Advertised. Bids opened December 31, 1912.

Contract No. 94.— For constructing hydro-electric power-plants and equipment for operating and lighting Locks Nos. 26 to 35, inclusive, on the Erie canal. Engineer's estimate, $461,300. Drawings, 45 sheets. Time limit for completion, November 1, 1914. Plans approved by Canal Board November 26, 1912. Advertised. Bids opened December 31, 1912.

Bids Opened.

The detailed bids of two of the following contracts appear elsewhere; the others will be published later.

Contract No. 71-A.— For the completion of the work remaining to be done on Contract No. 71. Engineer's estimate, $1,017,625.03. Bids opened November 19, 1912. Three bids were received, the lowest being that of P. H. McGovern & Co., No. 1 Madison avenue, New York, N. Y., at $1,217,016.06. Contract not awarded.

Contract No. 72-A.— For the completion of the work remaining to be done on Contract No. 72. Engineer's estimate, $1,125,036. Bids opened November 19, 1912. One bid was received, that of James Stewart & Co., 30 Church street, New York, N. Y., at $1,534,732.25. Contract not awarded.

Contract No. 103.— For the construction of a concrete arch bridge over the Oswego river and a bascule bridge over the Oswego canal, at Phoenix, N. Y. Advertised. Bids opened November 26, 1912. Four bids were received, the lowest of which was that of Barrally & Ingersoll, 850 Powers building, Rochester, N. Y., to whom it was subsequently awarded at $197,995.

Contract No. 37-R.— For the removal of bodies from the Minetto cemetery, within Contract No. 37, to a new cemetery outside the flow line. Bids opened November 19, 1912. Six bids were received, the lowest being that of Salladin & Henrick, 94 W. Cayuga street, Oswego, N. Y., to whom it was subsequently awarded, at $4,890.80.

Recapitulation — Progress on Plans.

Contract No.	DESCRIPTION.	Canal.	Progress on plans.
18A	Mindenville to Castle creek	Erie	Approved by Canal Board.
37R	Removal of bodies at Minetto	Oswego	Awarded.
42A	Supplemental to Contract 42	Erie	Approved by Canal Board.
59	Rochester harbor dam	Erie	90 per cent completed.
65	Canal and aqueduct at Medina	Erie	Approved by Canal Board.
71A	Supplemental to Contract 71	Champlain	Bids opened.
72A	Supplemental to Contract 72	Champlain	Bids opened.
74	Dredging Hudson river to Contract 2-E	Erie	Before Canal Board.
84	Two lift-bridges at Clyde	Erie	Suspended.
87	Bridge near Rocky Rift dam	Erie	Approved by Canal Board.
92	Power-house and lock equipments	Erie, Champlain	Advertised.
93	Power-house and lock equipments	Erie, Oswego and Cayuga and Seneca	10 per cent completed.
94	Power-plants, etc., for Locks 26 to 35	Erie	Advertised.
100	Bridges on Contracts 12, 37, 39 and 57	Erie, Oswego	10 per cent completed.
102	Bridge at Howland's island	Erie	Approved by Canal Board.
103	Bridge at Phoenix	Oswego	Awarded.
106	Bridges on Contracts 61, 64, 65 and 67	Erie	96 per cent completed.
107	Lift-bridge at Little Falls	Erie	Approved by Canal Board.
108	Bridges on Contracts 48 and 76	Erie	25 per cent completed.
110	Bridges at Rome	Erie	30 per cent completed.
C	Locks, dam, etc., at Seneca Falls	Cayuga and Seneca	Advertised.
D	Dredging, Demont's bridge to Waterloo	Cayuga and Seneca	Completed.
E	Lock, dam, etc., at Waterloo	Cayuga and Seneca	Advertised.

Bid for Contract No. 72-A.

ITEMS.	Measure.	Quantities.	Engineer's Estimate.		James Stewart & Co., 30 Church St., New York, N. Y.	
			Price.	Amount.	Price.	Amount.
Clearing	lump sum	.....	$100 00	$100 00	$100 00	$100 00
Excavation	cu. yd.	540,939	2 00	1,081,878 00	2 75	1,487,582 25
Sheeting and bracing	M. ft. B. M.	2	55 00	110 00	60 00	120 00
Round timber bracing	lin. ft.	400	24	96 00	25	100 00
Stone filing in cribs	cu. yd.	2,400	2 70	6,480 00	3 00	7,200 00
Rock spoil filling	cu. yd.	1,000	70	700 00	1 00	1,000 00
Structural steel	lb.	9,000	06	540 00	06	540 00
Iron castings, plain	lb.	5,800	04	232 00	05	290 00
Sawed lumber	M. ft. B. M.	180	55 00	9,900 00	60 00	10,800 00
Completing construction of upper guide wall	lump sum	.....	25,000 00	25,000 00	27,000 00	27,000 00
Total	.....	.....	.....	$1,125,036 00	.....	$1,534,735 25

ITEMS.	Measure.	Quantities.	ENGINEER'S ESTIMATE.		P. H. McGOVERN & Co., 1 MADISON AVE., NEW YORK CITY.		GRANT, SMITH & Co. & LOCHER, 25 W. 42D ST., NEW YORK CITY.		JAMES STEWART & Co., 30 CHURCH ST., NEW YORK CITY.	
			Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.
Clearing	lump sum	.....	$250 00	$250 00	$250 00	$250 00	$250 00	$250 00	$250 00	$250 00
Excavation	cu. yd	394,236	2 10	827,895 60	2 55	1,005,301 80	2 85	1,123,572 60	2 60	1,025,013 60
Sheeting and bracing	M. ft. B. M.	20	55 00	1,100 00	55 00	1,100 00	55 00	1,100 00	60 00	1,200 00
Round timber bracing	lin. ft	500	24	120 00	24	120 00	24	120 00	25	125 00
Forming embankment	cu. yd	320	15	48 00	15	48 00	15	48 00	50	160 00
Lining	cu. yd	100	1 50	150 00	1 50	150 00	1 50	150 00	2 00	200 00
Sawed lumber (yellow pine or Douglas fir)	M. ft. B. M.	1.5	55 00	82 50	55 00	82 50	55 00	82 50	70 00	105 00
White oak lumber in miter sills and lock gates	M. ft. B. M.	8	100 00	800 00	100 00	800 00	100 00	800 00	100 00	800 00
Second-class concrete	cu. yd	16,411	7 50	123,082 50	9 00	147,699 00	7 50	123,082 50	8 25	135,390 75
Second-class reinforced concrete	cu. yd	320	12 00	3,840 00	12 00	3,840 00	12 00	3,840 00	12 00	3,840 00
Wash wall	cu. yd	420	2 50	1,050 00	2 50	1,050 00	2 50	1,050 00	3 00	1,260 00
Third-class stone paving	sq. yd	490	2 00	980 00	2 00	980 00	2 00	980 00	2 50	1,225 00
First-class riprap	cu. yd	300	3 00	900 00	3 00	900 00	3 00	900 00	3 00	900 00
Second-class riprap	cu. yd	1,480	3 00	4,440 00	3 00	4,440 00	3 00	4,440 00	3 00	4,440 00
Third-class riprap	cu. yd	300	3 00	900 00	3 00	900 00	3 00	900 00	3 00	900 00
Fourth-class riprap	cu. yd	880	2 50	2,200 00	2 50	2,200 00	2 50	2,200 00	3 00	2,640 00
Structural steel	lb	15,183	06	910 98	06	910 98	06	910 98	06	910 98
Metal reinforcement	lb	39,323	04½	1,769 54	05	1,966 15	04½	1,769 54	05	1,966 15
Iron castings, plain	lb	12,080	04½	543 60	05	604 00	04½	543 60	05	604 00
Iron castings, machined	lb	2,783	06	166 98	10	278 30	06	166 98	06	166 98
Metal in lock gates	lb	235,561	06½	15,311 46	06½	15,311 46	06½	15,311 46	07	16,489 27
Metal in buffer-beams	lb	44,824	06½	2,913 56	06½	2,913 56	06½	2,913 56	07	3,137 68
Metal in lock valves	lb	32,821	11	3,610 31	11	3,610 31	11	3,610 31	11	3,610 31
Drilling bolt holes in rock	lin. ft	1,100	60	660 00	60	660 00	60	660 00	1 00	1,100 00
Coffer-dams, pumping, bailing and draining	lump sum	.....	23,000 00	23,000 00	20,000 00	20,000 00	23,000 00	23,000 00	25,000 00	25,000 00
Storehouse	lump sum	.....	1,000 00	1,000 00	1,000 00	1,000 00	1,000 00	1,000 00	1,000 00	1,000 00
				$1,017,725 03		$1,217,116 06		$1,313,402 03		$1,232,434 72
Deduct for buildings	lump sum	.....	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00
Total		.....	.....	$1,017,625 03	.....	$1,217,016 06	.....	$1,313,302 03	.....	$1,232,334 72

INDEX.

A.

Award of contracts, 65, 103, 128, 157, 190, 262, 300, 330, 362.

B.

Barge canal:
- Charting by U. S., 75.
- Compared with Panama canal, 74.
- Engineering department, 82, 130, 194.
- Pollution of waters, 72.
- Record for 1911; 32, 35.
- State Fair exhibit, 75.
- Terminals, report, 73.

Bids, detailed:
- Contract No. 5-A; 80.
- Contract No. 8-A; 229–31.
- Contract No. 10-B; 104.
- Contract No. 14-A; 364.
- Contract No. 22-A; 267.
- Contract No. 56; 332.
- Contract No. 57; 266.
- Contract No. 70-A; 363.
- Contract No. 71-A; 397.
- Contract No. 72-A; 364, 396.
- Contract No. 89; 191–2.
- Contract No. 90-A; 268.
- Contract No. 101; 264–5.
- Contract No. 104; 38–9.
- Contract No. 105; 158–9.
- Contract H; 40.
- Contract I; 331.

Bids opened, 29, 224, 330, 395.

Black river survey, report, 69.

Brief account of contract work. *See* Construction, brief account of.

C.

Canal Board. *See* Plans before Canal Board.

Canal maintenance, report, 31.

Cayuga and Seneca canal, contract plans, status:
- To January 1; 28.
- To February 1; 63.
- To March 1; 102.
- To April 1; 126.
- To May 1; 155.
- To June 1; 188.
- To July 1; 223.
- To August 1; 261.
- To September 1; 298.
- To October 1; 329.
- To November 1; 361.
- To December 1; 393.

Cayuga and Seneca canal, contract work:
- For December, 1911; 24.
- For January, 1912; 60.

Cayuga and Seneca canal, contract work — (*Continued*):
- For February, 1912; 99.
- For March, 1912; 123.
- For April, 1912; 151.
- For May, 1912; 184.
- For June, 1912, 219.
- For July, 1912; 258.
- For August, 1912; 295.
- For September, 1912; 325.
- For October, 1912; 357.
- For November, 1912; 389.

Champlain canal, contract plans, status:
- To January 1; 27.
- To February 1; 63.
- To March 1; 101.
- To April 1; 126.
- To May 1; 155.
- To June 1; 188.
- To July 1; 224.
- To August 1; 262.
- To September 1; 299.
- To October 1; 329.
- To November 1; 362.
- To December 1; 394.

Champlain canal, contract work:
- For December, 1911, 19.
- For January, 1912; 56.
- For February, 1912; 95.
- For March, 1912; 119.
- For April, 1912; 147.
- For May, 1912; 180.
- For June, 1912; 214.
- For July, 1912; 253.
- For August, 1912; 290.
- For September, 1912; 320.
- For October, 1912; 352.
- For November, 1912; 385.

Cohoes, dam at, 71.

Construction, brief account of:
- For December, 1911; 3.
- For January, 1912; 43.
- For February, 1912; 84.
- For March, 1912; 108.
- For April, 1912; 133.
- For May, 1912; 163.
- For June, 1912; 197.
- For July, 1912; 236.
- For August, 1912; 272.
- For September, 1912; 303.
- For October, 1912; 335.
- For November, 1912; 368.

Construction, detailed, by items of work:
- To January 1; 78.
- To June 1; 226.

Construction, table of progress:
To January 1; 2.
To February 1; 42.
To March 1; 83.
To April 1; 106.
To May 1, 131.
To June 1; 162.
To July 1, 195.
To August 1; 234.
To September 1; 270.
To October 1; 302.
To November 1; 334.
To December 1; 366.
Contents, table of:
January *Bulletin*, 1.
February *Bulletin*, 41.
March *Bullctin*, 81.
April *Bulletin*, 105.
May *Bulletin*, 129.
June *Bulletin*, 161.
July *Bulletin*, 193.
August *Bulletin*, 233.
September *Bulletin*, 269.
October *Bullctin*, 301.
November *Bulletin*, 331.
December *Bulletin*, 365.
Contractors' addresses, 160, 232.
Contract plans, status, by contracts:
No. 5-A; 28, 65.
No. 8-A; 127, 156, 189, 190, 224.
No. 10-B; 28, 64, 103.
No. 14-A; 298, 329, 362.
No. 18-A; 27, 62, 101, 125, 154, 188, 222, 260, 298, 329, 360, 394.
No. 22-A; 154, 189, 224, 263.
No. 37-R; 223, 261, 298, 329, 362, 395.
No. 42-A; 361, 394.
No. 55-A; 363.
No. 56; 27, 63, 101, 126, 155, 188, 224, 262, 300, 330.
No. 57; 27, 63, 101, 125, 154, 189, 224, 263.
No. 59; 27, 63, 101, 126, 154, 188, 222, 261, 298, 328, 360, 393.
No. 65; 27, 63, 101, 126, 155, 188, 223, 261, 298, 328, 360, 394.
No. 70-A; 262, 299, 330, 362.
No. 71-A; 300, 330, 362, 395.
No. 72-A; 262, 300, 330, 362, 395.
No. 74; 26, 62, 101, 125, 154, 188, 222, 260, 299, 329, 362, 393.
No. 84; 27, 63, 101, 125, 154, 188, 222, 260, 298, 328, 360, 392.
No. 87; 360, 394.
Contract plans, status, by contracts—(*Continued*):
No. 89; 27, 63, 101, 126, 156, 190.
No. 90-A; 102, 127, 156, 190, 224, 263.
No. 92; 28, 64, 102, 127, 156, 189, 224, 262, 299, 329, 362, 394.
No. 94; 299, 329, 361, 395.
No. 100; 392.
No. 101; 27, 63, 101, 125, 156, 189, 224, 262.
No. 102; 360, 394.
No. 103; 27, 63, 101, 126, 156, 189, 190, 224, 262, 298, 328, 361, 395.
No. 104; 29, 65, 103, 128.
No. 105; 27, 64, 102, 127, 157.
No. 106; 126, 155, 188, 222, 261, 298, 328, 361, 393.
No. 107; 360, 394.
No. 108; 393.
No. 110; 392.
No. 115; 328, 361, 393.
C; 28, 64, 102, 126, 155, 188, 223, 261, 299, 329, 361, 394.
D; 28, 64, 102, 126, 155, 188, 223, 261, 299, 329, 361, 393.
E; 28, 64, 102, 127, 155, 188, 223, 261, 299, 329, 361, 394.
F; 28, 64, 102, 127, 155, 189, 223, 261, 299.
G; 28, 64, 102, 127, 155, 189, 223, 261, 298.
H; 29.
I; 64, 102, 127, 155, 189, 223, 262, 300.
J; 64, 102, 127, 155, 189, 223, 261, 299.
Contracts advertised, 28, 64, 102, 127, 156, 190, 224, 262, 299, 329, 362, 394.
Contracts, award, 65, 103, 128, 157, 190, 262, 300, 330, 362.
Contract work, by contracts:
No. 1; 21, 58, 96, 120, 148, 181, 215, 254, 291, 321, 353, 386.
No. 2-E; 4, 44, 85, 108, 133, 164, 197, 236, 272, 304, 336, 368.
No. 4-B; 10, 48.
No. 5-A; 90, 113, 140, 171, 205, 245, 282, 313, 344, 377.
No. 6; 15, 52.
No. 8; 6, 45, 86, 109, 135, 166, 199.
No. 8-A; 238, 274, 306, 371.
No. 10-A; 23, 59, 98, 122, 150, 183, 218, 256, 293, 324, 355, 388.

Contract work, etc.— (*Continued*):
No. 10-B; 122; 150, 183, 218, 257, 294, 324, 355, 388.
No. 11; 4, 44, 85, 109, 134, 164, 198, 237, 273, 304, 336, 368.
No. 12; 10, 48, 89, 112, 139, 171, 204, 243, 280, 311, 343, 375.
No. 13; 4, 44, 85, 108, 133, 164, 197, 236, 272, 304, 336, 368.
No. 14; 4, 44, 85, 109, 134, 165, 198, 237, 273, 305, 337, 369.
No. 14-A; 370.
No. 14-R; 5, 45, 86, 109, 135, 165, 199, 238, 274, 306, 338.
No. 15; 22, 59, 98.
No. 16; 3, 44, 85, 108, 133, 164, 197, 236, 272, 304, 336, 368.
No. 17; 6, 45, 86, 110, 135, 166, 199, 238, 275, 307, 371.
No. 19; 18, 56, 95, 119, 147, 180, 213, 253, 290, 320, 352, 384.
No. 20-A; 7, 46, 87, 110, 136, 167, 201, 240, 276, 308, 339, 372.
No. 20-B; 7, 46, 87, 110, 136, 166, 200, 239, 275, 307, 339, 372.
No. 20-C; 6, 46, 86, 110, 135, 166, 200, 239, 275, 307, 339, 371.
No. 20-D; 5, 45, 86, 109, 135, 165, 199, 238, 274, 306, 338, 370.
No. 21; 14, 52, 92, 115, 142, 175, 208, 247, 286, 316, 348, 380.
No. 22; 11, 48, 89, 112, 139, 171, 205, 244, 281, 312, 343, 376.
No. 22-A; 281, 312, 344, 376.
No. 23; 13, 51, 92, 115, 142, 174, 208, 247, 285, 315, 347, 379.
No. 24; 21, 58, 96, 121, 148, 181, 215, 254, 291, 321, 353, 386.
No. 25; 22, 59, 97, 121, 149, 182, 217, 255, 292, 323, 354, 387.
No. 27-A; 21; 58, 97, 121, 149, 181, 216, 255, 292, 322, 353, 386.
No. 29; 9, 47, 88, 111, 138, 169, 203, 242, 279, 310, 341, 374.

Contract work, etc.— (*Continued*):
No. 30; 8, 47, 87, 111, 137, 168, 202, 241, 277, 309, 340, 373.
No. 31; 7, 46, 87, 110, 136, 167, 201, 240, 276, 308, 340, 373.
No. 33; 3, 43, 84, 108, 133, 163, 197, 236.
No. 35; 23, 60, 99, 123, 151, 184, 219, 257, 294, 325, 356, 389.
No. 36; 4, 44, 85, 108, 133.
No. 37; 23, 60, 99, 123, 150, 183, 218, 257, 294, 324, 356, 388.
No. 39; 22, 59, 98, 122, 150, 182, 217, 256, 293, 323, 355, 387.
No. 40; 18, 55, 95, 118, 146, 179, 213, 252, 290, 320, 351, 384.
No. 42; 9, 47, 88, 111, 138, 170, 204, 243, 279, 310, 342, 374.
No. 43; 10, 48, 88, 112, 138, 170, 204, 243, 279, 310, 342, 375.
No. 44; 10, 48, 88, 112, 138, 170, 204, 243, 280, 311, 342, 375.
No. 46; 11, 49, 89, 112, 139, 171, 205, 244, 281, 312, 344, 376.
No. 47; 11, 49, 89, 112, 139, 171, 205, 244, 282, 313, 344, 377.
No. 48; 11, 49, 90, 113, 140, 172, 206, 245, 282, 313, 345, 377.
No. 49; 12, 50, 91, 114, 141, 173, 207, 246, 284, 314, 346, 378.
No. 50; 24, 61, 99, 124, 152, 185, 220, 258, 296, 326, 358, 390.
No. 51; 24, 61, 99, 124, 152, 185, 220, 259, 296, 327, 358, 390.
No. 54; 21, 58, 97, 121, 148, 181, 215, 254, 292, 322, 353, 386.
No. 55; 25, 61, 100, 124, 152, 186, 221, 259, 296, 327, 359, 391.
No. 55-A; 391.
No. 55-R; 25, 62, 100, 124, 153, 186, 221, 259, 297, 327, 359, 391.
No. 56; 359, 391.
No. 57; 281, 312, 344, 376.

Contract work, etc.— (*Continued*):
No. 60; 15, 52, 92, 116, 143, 175, 210, 250, 287, 317, 349, 382.
No. 61; 15, 53, 93, 116, 143, 176, 210, 250, 287, 318, 349, 382.
No. 62; 16, 53, 93, 116, 144, 176, 211, 250, 288, 318, 350, 383.
No. 63; 13, 50, 91, 114, 141, 173, 207, 247, 284, 315, 346, 379.
No. 64; 17, 54, 94, 117, 145, 177, 212, 251, 289, 319, 350, 383.
No. 66; 17, 54, 94, 117, 145, 178, 212, 251, 289, 319, 351, 384.
No. 67; 18, 55, 94, 118, 146, 178, 212, 252, 289, 319, 351, 384.
No. 68; 20, 57, 96, 120.
No. 69; 19, 57, 96, 120, 148, 180, 214, 253, 291, 321, 352, 385.
No. 70; 19, 56, 95, 119, 147, 180, 214, 253, 290, 320, 352, 385.
No. 70-A; 385.
No. 71; 19, 56, 96, 119, 148, 180, 214, 253, 291, 320, 352, 385.
No. 72; 20, 57, 96, 120, 148, 181, 214, 254, 291, 321, 353, 385.
No. 73; 20, 57.
No. 75; 15, 52, 92, 116, 143, 175, 209, 249, 286, 317, 348, 381.
No. 76; 12, 50, 90, 113, 140, 172, 206, 246, 283, 314, 345, 378.
No. 77; 12, 50, 90, 113, 140, 172, 207, 246, 283, 314, 346, 378.
No. 78; 23, 60, 98, 122.
No. 79; 23, 60, 99, 122, 150, 184.
No. 80; 22, 59, 98, 122, 150, 183, 217, 256, 293, 323, 355, 387.
No. 82; 14, 52, 92, 115, 143, 175, 209, 249, 286, 317, 348, 381.
No. 85; 22, 59, 98, 122, 150, 183, 217, 256, 293, 323, 355, 387.
No. 86; 6, 46, 86, 110, 136, 166, 200, 239, 275, 307, 339, 371.
No. 88; 20, 58, 96, 120, 148, 181, 215, 254, 291, 321, 353, 385.
Contract work, etc.— (*Continued*):
No. 89; 206, 245, 282, 313, 345, 377.
No. 90; 26, 62, 100, 124, 153, 187, 221, 260, 297, 327, 359, 392.
No. 90-A; 297, 328, 360, 392.
No. 91; 25, 62, 100, 124, 153, 187, 221, 260, 297, 327, 359, 391.
No. 101; 281, 312, 343, 376.
No. 104; 150, 183, 218, 256, 293, 324, 355, 387.
No. 105; 175, 210, 249, 287, 317, 348, 381.
A; 24, 60, 99, 123, 151, 184, 219, 258, 295, 325, 357, 389.
B; 24, 60, 99, 123, 151, 185, 219, 258, 295, 326, 357, 389.
H; 61, 99, 123, 152, 185, 220, 258, 295, 326, 357, 390.
I; 326, 358, 390.

E.

Engineering department — Barge canal, 82, 130, 194.
Erie canal, contract plans, status:
To January 1; 26.
To February 1; 62.
To March 1; 101.
To April 1; 125.
To May 1; 154.
To June 1; 188.
To July 1; 222.
To August 1; 260.
To September 1; 298.
To October 1; 328.
To November 1; 360.
To December 1; 392.
Erie canal, contract work:
For December, 1911; 3.
For January, 1912; 43.
For February, 1912; 84.
For March, 1912; 108.
For April, 1912; 133.
For May, 1912; 163.
For June, 1912; 197.
For July, 1912; 236.
For August, 1912; 272.
For September, 1912; 304.
For October, 1912; 336.
For November, 1912; 368.

H.

Hydraulics, bureau, report, 77.
Hydrographic survey, report, 68.

L.

Lands, canal, mapping of, 66.

M.

Mapping canal lands, 66.
Mohawk river, bridge between Cohoes and Schenectady, 71.

O.

Oswego canal, contract plans, status:
To January 1; 27, 28.
To February 1; 63.
To March 1; 101.
To April 1; 126.
To July 1; 223.
To August 1; 261.
To September 1; 298.
To October 1; 328.
To November 1; 361.
To December 1; 393.

Oswego canal, contract work:
For December, 1911; 22.
For January, 1912; 59.
For February, 1912; 98.
For March, 1912; 122.
For April, 1912; 150.
For May, 1912; 182.
For June, 1912; 217.
For July, 1912; 256.
For August, 1912; 293.
For September, 1912; 323.
For October, 1912; 355.
For November, 1912; 387.

P.

Plans before Canal Board:
In December, 1911; 28.
In January, 1912; 64.
In March, 1912; 127.
In April, 1912; 156.
In May, 1912; 189.
In June, 1912; 224.
In July, 1912; 262.
In August, 1912; 299.
In September, 1912; 329.
In October, 1912; 361.
In November, 1912; 393.

Plans, progress of preparation:
To January 1; 26.
To February 1; 62.
To March 1; 100.
To April 1; 125.
To May 1; 154.
To June 1; 187.
To July 1; 222.
To August 1; 260.
To September 1; 297.
To October 1; 328.
To November 1; 360.
To December 1; 392.

Plans, progress on, recapitulation:
To January 1; 29.
To February 1; 65.
To March 1; 103.
To April 1; 128.
To May 1; 157.
To June 1; 190.
To July 1; 225.
To August 1; 263.
To September 1; 300.
To October 1; 330.
To November 1; 363.
To December 1; 396.

Power-supply, contract plans, status:
To January 1; 28.
To February 1; 64.
To March 1; 102.
To April 1; 127.
To May 1; 156.
To June 1; 189.
To July 1; 224.
To August 1; 262.
To September 1; 299.
To October 1; 329.
To November 1; 361.
To December 1; 393.

Power-supply, contract work:
For December, 1911; 25.
For January, 1912; 62.
For February, 1912; 100.
For March, 1912; 124.
For April, 1912; 153.
For May, 1912; 187.
For June, 1912; 221.
For July, 1912; 260.
For August, 1912; 297.
For September, 1912; 327.
For October, 1912; 359.
For November, 1912; 391.

Progress of contract work. *See* Construction, table of progress.

Progress of plans being prepared. *See* Plans, progress of preparation.

R.

Railroad crossings, progress, 32.

Recapitulation, progress on plans. *See* Plans, progress on, recapitulation.

S.

State Engineer and Surveyor, Annual report for 1911; 30, 66.

T.

Table of contents. *See* Contents, table of.

Terminals, canal, report, 73.

Testing laboratory, report, 76.

Topographic survey, report, 67.

Total amount of construction work. *See* Construction, detailed, by items of work.

Troy dam, report, 34.

W.

Water-supply, contract work:
For December, 1911; 24.
For January, 1912; 61.
For February, 1912; 99.
For March, 1912; 124.
For April, 1912; 152.
For May, 1912; 185.
For June, 1912; 220.
For July, 1912; 258.
For August, 1912; 296.
For September, 1912; 326.
For October, 1912; 358.
For November, 1912; 390.

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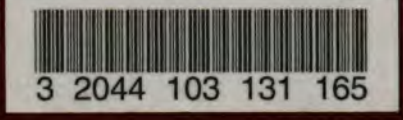
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